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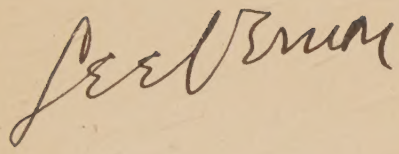

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ESSAYS FOR COLLEGE MEN

Education, Science, and Art

Chosen by

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Of the University of Wisconsin

NEW YORK
HENRY HOLT AND COMPANY
1913

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ESSAYS FOR COLLEGE MEN

THE SPIRIT OF LEARNING[1]

WOODROW WILSON

We have fallen of late into a deep discontent with the college, with the life and the work of the undergraduates in our universities. It is an honorable discontent, bred in us by devotion, not by captiousness or hostility or by an unreasonable impatience to set the world right. We are not critics, but anxious and thoughtful friends. We are neither cynics nor pessimists, but honest lovers of a good thing, of whose slightest deterioration we are jealous. We would fain keep one of the finest instrumentalities of our national life from falling short of its best, and believe that by a little care and candor we can do so.

The American college has played a unique part in American life. So long as its aims were definite and its processes authoritative it formed men who brought to their tasks an incomparable morale, a capacity that seemed more than individual, a

[1] Oration delivered before the Harvard Chapter of Phi Beta Kappa, Sanders Theatre, Cambridge, July 1, 1909. Reprinted through the generous permission of Woodrow Wilson and of *The Harvard Graduates' Magazine.*

power touched with large ideals. The college has been the seat of ideals. The liberal training which it sought to impart took no thought of any particular profession or business, but was meant to reflect in its few and simple disciplines the image of life and thought. Men were bred by it to no skill or craft or calling: the discipline to which they were subjected had a more general object. It was meant to prepare them for the whole of life rather than for some particular part of it. The ideals which lay at its heart were the general ideals of conduct, of right living, and right thinking, which made them aware of a world moralized by principle, steadied and cleared of many an evil thing by true and catholic reflection and just feeling, a world, not of interests, but of ideas.

Such impressions, such challenges to a man's spirit, such intimations of privilege and duty are not to be found in the work and obligations of professional and technical schools. They cannot be. Every calling has its ethics, indeed, its standards of right conduct and wrong, its outlook upon action and upon the varied relationships of society. Its work is high and honorable, grounded, it may be, in the exact knowledge which moralizes the processes of thought, and in a skill which makes the whole man serviceable. But it is notorious how deep and how narrow the absorptions of the professional school are and how much they

are necessarily concentrated upon the methods and interests of a particular occupation. The work to be done in them is as exact, as definite, as exclusive as that of the office and the shop. Their atmosphere is the atmosphere of business, and should be. It does not beget generous comradeships or any ardor of altruistic feeling such as the college begets. It does not contain that general air of the world of science and of letters in which the mind seeks no special interest, but feels every intimate impulse of the spirit set free to think and observe and listen,—listen to all the voices of the mind. The professional school differs from the college as middle age differs from youth. It gets the spirit of the college only by imitation or reminiscence or contagion. This is to say nothing to its discredit. Its nature and objects are different from those of the college,—as legitimate, as useful, as necessary; but different. The college is the place of orientation; the professional school is the place of concentration. The object of the college is to liberalize and moralize; the object of the professional school is to train the powers to a special task. And this is true of all vocational study.

I am, of course, using the words liberalize and moralize in their broadest significance, and I am very well aware that I am speaking in the terms of an ideal, a conception, rather than in the terms

of realized fact. I have spoken, too, of what the college did "so long as its aims were definite and its processes authoritative," as if I were thinking of it wholly in the past tense and wished to intimate that it was once a very effective and ideal thing but had now ceased to exist; so that one would suppose that I thought the college lost out of our life and the present a time when such influences were all to seek. But that is only because I have not been able to say everything at once. Give me leave, and I will slowly write in the phrases which will correct these impressions and bring a true picture to light.

The college has lost its definiteness of aim, and has now for so long a time affected to be too modest to assert its authority over its pupils in any matter of prescribed study that it can no longer claim to be the nurturing mother it once was; but the college is neither dead nor moribund, and it has made up for its relaxed discipline and confused plans of study by many notable gains, which, if they have not improved its scholarship, have improved the health and the practical morals of the young gentlemen who resort to it, have enhanced their vigor and quickened their whole natures. A freer choice of studies has imparted to it a stir, an air of freedom and individual initiative, a wealth and variety of instruction which the old college altogether lacked. The development

of athletic sports and the immoderate addiction of undergraduates to stimulating activities of all sorts, academic and unacademic, which improve their physical habits, fill their lives with interesting objects, sometimes important, and challenge their powers of organization and practical management, have unquestionably raised the tone of morals and of conduct in our colleges and have given them an interesting, perhaps valuable, connection with modern society and the broader popular interests of the day. No one need regret the breaking-up of the dead levels of the old college, the introduction and exaltation of modern studies, or the general quickening of life which has made of our youngsters more manly fellows, if less docile pupils. There had come to be something rather narrow and dull and morbid, no doubt, about the old college before its day was over. If we gain our advances by excessive reactions and changes which change too much, we at least gain them, and should be careful not to lose the advantage of them.

Nevertheless, the evident fact is, that we have now for a long generation devoted ourselves to promoting changes which have resulted in all but complete disorganization, and it is our plain and immediate duty to form our plans for reorganization. We must reëxamine the college, reconceive it, reorganize it. It is the root of our intellectual

life as a nation. It is not only the instrumentality through which we must effect all the broad preliminary work which underlies sound scholarship; it is also our chief instrumentality of catholic enlightenment, our chief means for giving widespread stimulation to the whole intellectual life of the country and supplying ourselves with men who shall both comprehend their age and duty and know how to serve them supremely well. Without the American college our young men would be too exclusively shut in to the pursuit of individual interests, would lose the vital contacts and emulations which awaken them to those larger achievements and sacrifices which are the highest objects of education in a country of free citizens, where the welfare of the commonwealth springs out of the character and the informed purposes of the private citizen. The college will be found to lie somewhere very near the heart of American social training and intellectual and moral enlightenment.

The process is familiar to every one by which the disintegration was brought about which destroyed the old college with its fixed disciplines and ordered life and gave us our present problem of reorganization and recovery. It centred in the break-up of the old curriculum and the introduction of the principle that the student was to select his own studies from a great variety of courses, as great a variety as the resources of the college

and the supply of teachers available made possible. But the change could not in the nature of things stop with the plan of study. It held at its heart a tremendous implication: the implication of full manhood on the part of the pupil, and all the untrammeled choices of manhood. The pupil who was mature and well informed enough to study what he chose was also by necessary implication mature enough to be left free to *do* what he pleased, to choose his own associations and ways of life outside the curriculum without restraint or suggestion; and the varied, absorbing college life of our day sprang up as the natural offspring of the free election of studies.

There went along with the relaxation of rule as to what undergraduates should study, therefore, an almost absolute divorce between the studies and the life of the college, its business and its actual daily occupations. The teacher ceased to look upon himself as related in any responsible way to the life of his pupils, to what they should be doing and thinking of between one class exercise and another, and conceived his whole duty to have been performed when he had given his lecture and afforded those who were appointed to come the opportunity to hear and heed it if they chose. The teachers of this new régime, moreover, were most of them trained for their teaching work in German universities, or in American universi-

ties in which the methods, the points of view, the spirit, and the object of the German universities were, consciously or unconsciously, reproduced. They think of their pupils, therefore, as men already disciplined by some general training such as the German gymnasium gives, and seeking in the university special acquaintance with particular studies, as an introduction to special fields of information and inquiry. They have never thought of the university as a community of teachers and pupils: they think of it, rather, as a body of teachers and investigators to whom those may resort who seriously desire specialized kinds of knowledge. They are specialists imported into an American system which has lost its old point of view and found no new one suitable to the needs and circumstances of America. They do not think of living with their pupils and affording them the contacts of culture; they are only accessible to them at stated periods and for a definite and limited service; and their teaching is an interruption to their favorite work of research.

Meanwhile, the constituency of the college has wholly changed. It is not only the bookish classes who now send their sons to college, but also the men of business and of affairs, who expect their sons to follow in their own footsteps and do work with which books have little connection. In the old days of which I have spoken most young men

who went to college expected to enter one or other of the learned professions, expected to have to do with books and some of the more serious kinds of learning all their lives. Books were their proper introduction to the work that lay before them; learning was their natural discipline and preparation. But nowadays the men who are looking forward to the learned professions are in a minority at the college. Most undergraduates come out of an atmosphere of business and wish a breeding which is consonant with it. They do not wish learning. They wish only a certain freshening of their faculties for the miscellaneous contacts of life, a general acquaintance with what men are doing and saying in their own generation, a certain facility in handling themselves and in getting on with their fellows. They are much more interested in the incidental associations of college life than in the main intellectual occupations of the place. They want to be made men of, not scholars; and the life led at college is as serviceable for that as any of the tasks set in the class-room. If they want what the formal teaching offers them at all, it is for some definite and practical purpose connected with the calling they expect to follow, the business they expect to engage in. Such pupils are specially unsuitable for such teachers.

Here, then, is our situation. Here is the little

world of teachers and pupils, athletic associations, musical and literary clubs, social organizations and societies for amusement, class-room and playground, of which we must make analysis, out of which we must get a new synthesis, a definite aim, and new processes of authoritative direction, losing nothing that has been gained, recovering what has been lost. All the fresh elements we have gained are valuable, many of the new points of view are those from which we must look upon the whole task and function of the college if we would see it truly; but we have fallen upon an almost hopeless confusion and an utter dispersion of energy. We must pull the whole inorganic thing together under a new conception of what the college must be and do.

The chief and characteristic mistake which the teachers and governors of our colleges have made in these latter days has been that they have devoted themselves and their plans too exclusively to the business, the very commonplace business, of instruction, to well-conceived lectures and approved class-room method, and have not enough regarded the life of the mind. The mind does not live by instruction. It is no prolix gut to be stuffed. The real intellectual life of a body of undergraduates, if there be any, manifests itself, not in the class-room, but in what they do and talk of and set before themselves as their favorite ob-

jects between classes and lectures. You will see the true life of a college in the evenings, at the dinner-table or beside the fire in the groups that gather and the men that go off eagerly to their work, where youths get together and let themselves go upon their favorite themes,—in the effect their studies have upon them when no compulsion of any kind is on them and they are not thinking to be called to a reckoning of what they know.

The effects of learning are its real tests, the real tests alike of its validity and of its efficacy. The mind can be driven, but that is not life. Life is voluntary or unconscious. It is breathed in out of a sustaining atmosphere. It is shaped by environment. It is habitual, continuous, productive. It does not consist in tasks performed, but in powers gained and enhanced. It cannot be communicated in class-rooms if its aim and end is the class-room. Instruction is not its source, but only its incidental means and medium.

Here is the key to the whole matter: the object of the college, as we have known and used and loved it in America, is not scholarship (except for the few, and for them only by way of introduction and first orientation), but the intellectual and spiritual life. Its life and discipline are meant to be a process of preparation, not a process of information. By the intellectual and spiritual life I mean the life which enables the mind to compre-

hend and make proper use of the modern world and all its opportunities. The object of a liberal training is not learning, but discipline and the enlightenment of the mind. The educated man is to be discovered by his point of view, by the temper of his mind, by his attitude towards life and his fair way of thinking. He can see, he can discriminate, he can combine ideas and perceive whither they lead; he has insight and comprehension. His mind is a practised instrument of appreciation. He is more apt to contribute light than heat to a discussion, and will oftener than another show the power of uniting the elements of a difficult subject in a whole view; he has the knowledge of the world which no one can have who knows only his own generation or only his own task.

What we should seek to impart in our colleges, therefore, is not so much learning itself as the spirit of learning. You can impart that to young men; and you can impart it to them in the three or four years at your disposal. It consists in the power to distinguish good reasoning from bad, in the power to digest and interpret evidence, in a habit of catholic observation and a preference for the non-partisan point of view, in an addiction to clear and logical processes of thought and yet an instinctive desire to interpret rather than to stick in the letter of the reasoning, in a taste for knowl-

edge and a deep respect for the integrity of the human mind. It is citizenship of the world of knowledge, but not ownership of it. Scholars are the owners of its varied plots, in severalty.

If we recognize and accept these ideas, this conception of the function and the possibilities of the college, there is hope of a general understanding and accommodation. At present there is a fundamental misunderstanding. The teachers in our colleges are men of learning and conceive it their duty to impart learning; but their pupils do not desire it; and the parents of their pupils do not desire it for them. They desire something else which the teacher has little thought of giving, generally thinks it no part of his function to give. Many of the parents of our modern undergraduates will frankly tell you that what they want for their sons is not so much what they will get in the class-room as something else, which they are at a loss to define, which they will get from the associations of college life: and many more would say the same thing if they were equally ingenuous. I know what they mean, and I am free to say that I sympathize with them. They understand that all that their boys get in the class-rooom is instruction in certain definite bodies of knowledge; that all that they are expected to bring away from their lectures and recitations is items of learning. They have consorted with college men,

if they are not college bred themselves, and know how very soon items of knowledge slip away from them, no matter how faithful and diligent they may have been in accumulating them when they were students. They observe that that part of the college acquisition is very soon lost. College graduates will tell you without shame or regret, within ten years of their graduation, that they remember practically nothing of what they learned in the class-room; and yet in the very same breath they will tell you that they would not have lost what they did get in college for anything in the world; and men who did not have the chance to go to college will everywhere be found to envy them, perceiving that college-bred men have something which they have not. What have they got, if learning is to be left out of the reckoning? They have got manliness, certainly, *esprit de corps*, the training of generous comradeships, a notable development of their social faculties and of their powers of appreciation; and they have lived under the influence of mental tasks of greater or less difficulty, have got from the class-room itself, from a quiet teacher here and there, some intimation, some touch of the spirit of learning. If they have not, they have got only what could no doubt be got from association with generous, self-respecting young men anywhere. Attendance on the exercises of the college

was only a means of keeping them together for four years, to work out their comradeships and their mutual infections.

I said just now that I sympathized with men who said that what they wanted for their sons in college was not what they got in the class-room so much as what they got from the life and associations of the place; but I agree with them only if what is to be got in the class-room is nothing more than items of knowledge likely to be quickly lost hold of. I agree with them; but I see clearly what they are blindly feeling after. They should desire chiefly what their sons are to get out of the life and associations of the place; but that life and those associations should be freighted with things they do not now contain. The processes of life, the contagions of association, are the only things that have ever got any real or permanent hold on men's minds. These are the conducting media for every effect we seek to work on the human spirit. The undergraduate should have scholars for teachers. They should hold his attention steadily upon great tested bodies of knowledge and should insist that he make himself acquainted with them, if only for the nonce. But they will give him nothing he is likely to carry with him through life if they stop with formal instruction, however thorough or exacting they may make it. Their permanent effects will be wrought upon his spirit.

Their teaching will follow him through life only if they reveal to him the meaning, the significance, the essential validity of what they are about, the motives which prompt it, the processes which verify it. They will rule him, not by what they know and inform him of, but by the spirit of the things they expound. And that spirit they cannot convey in any formal manner. They can convey it only atmospherically, by making their ideals tell in some way upon the whole spirit of the place.

How shall their pupils carry their spirit away with them, or the spirit of the things they teach, if beyond the door of the class-room the atmosphere will not contain it? College is a place of initiation. Its effects are atmospheric. They are wrought by impression, by association, by emulation. The voices which do not penetrate beyond the doors of the class-room are lost, are ineffectual, are void of consequence and power. No thought will obtain or live there for the transmission of which the prevailing atmosphere is a non-conducting medium. If young gentlemen get from their years at college only manliness, *esprit de corps*, a release of their social gifts, a training in give and take, a catholic taste in men, and the standards of true sportsmen, they have gained much, but they have not gained what a college should give them. It should give them insight into the things of the

mind and of the spirit, a sense of having lived and formed their friendships amidst the gardens of the mind where grows the tree of the knowledge of good and evil, a consciousness of having taken on them the vows of true enlightenment and of having undergone the discipline, never to be shaken off, of those who seek wisdom in candor, with faithful labor and travail of spirit.

These things they cannot get from the class-room unless the spirit of the class-room is the spirit of the place as well and of its life; and that will never be until the teacher comes out of the class-room and makes himself a part of that life. Contact, companionship, familiar intercourse is the law of life for the mind. The comradeships of undergraduates will never breed the spirit of learning. The circle must be widened. It must include the older men, the teachers, the men for whom life has grown more serious and to whom it has revealed more of its meanings. So long as instruction and life do not merge in our colleges, so long as what the undergraduates do and what they are taught occupy two separate, air-tight compartments in their consciousness, so long will the college be ineffectual.

Looked at from the point of view at which I stand in all that I have been saying, some of the proposals made in our day for the improvement of the college seem very strangely conceived. It

has been proposed, for example, to shorten the period of general study in college to (say) two years, and let the student who has gone the distance our present sophomores have gone enter at once upon his professional studies or receive his certificate of graduation. I take it for granted that those who have formulated this proposal never really knew a sophomore in the flesh. They say, simply, that the studies of our present sophomores are as advanced as the studies of seniors were in the great days of our grandfathers, and that most of our present sophomores are as old as our grandfathers were when they graduated from the pristine college we so often boast of; and I dare say that is all true enough. But what they do not know is, that our sophomore is at the age of twenty no more mature than the sophomore of that previous generation was at the age of seventeen or eighteen. The sap of manhood is rising in him but it has not yet reached his head. It is not what a man is studying that makes him a sophomore or a senior: it is the stage the college process has reached in him. A college, the American college, is not a body of studies: it is a process of development. It takes, if our observation can be trusted, at least four years for the completion of that process, and all four of those years must be college years. They cannot be school years: they

cannot be combined with school years. The school process is an entirely different one. The college is a process of slow evolution from the schoolboy and the schoolboy's mental attitude into the man and his entirely altered view of the world. It can be accomplished only in the college environment. The environment is of the essence of the whole effect.

If you wish to create a college, therefore, and are wise, you will seek to create a life. We have allowed ourselves to grow very anxious and to feel very helpless about college athletics. They play too large a part in the life of the undergraduate, we say; and no doubt they do. There are many other things which play too large a part in that life, to the exclusion of intellectual interests and the dissipation of much excellent energy: amusements of all kinds, social preoccupations of the most absorbing sort, a multitude of activities which have nothing whatever to do with the discipline and enlightenment of the mind. But that is because they are left a free field. Life, at college, is one thing, the work of the college another, entirely separate and distinct. The life is the field that is left free for athletics not only but also for every other amusement and diversion. Studies are no part of that life, and there is no competition. Study is the work which interrupts the life, introduces an embarrassing and inconsistent element

into it. The Faculty has no part in the life; it organizes the interruption, the interference.

This is not to say that there are not a great many undergraduates seriously interested in study, or that it is impossible or even difficult to make the majority of them, the large majority, pass the tests of the examinations. It is only saying that the studies do not spring out of the life of the place and are hindered by it, must resist its influences if they would flourish. I have no jealousy of athletics: it has put wholesome spirit into both the physical and the mental life of our undergraduates. There are fewer morbid boys in the new college which we know than there were in the old college which our fathers knew; and fewer prigs, too, no doubt. Athletics are indispensable to the normal life of young men, and are in themselves wholesome and delightful, besides. In another atmosphere, the atmosphere of learning, they could be easily subordinated and assimilated. The reason they cannot be now is that there is nothing to assimilate them, nothing by which they can be digested. They make their own atmosphere unmolested. There is no direct competition.

The same thing may be said, for it is true, of all the other amusements and all the social activities of the little college world. Their name is legion: they are very interesting; most of them are in themselves quite innocent and legitimate;

many of them are thoroughly worth while. They now engross the attention and absorb the energies of most of the finest, most spirited, most gifted youngsters in the undergraduate body, men fit to be scholars and masters in many fields, and for whom these small things are too trivial a preparation. They would not do so if other things which would be certain to grip these very men were in competition with them, were known and spoken of and pervasive in the life of the college outside the class-room; but they are not. The field is clear for all these little activities, as it is clear for athletics. Athletics has no serious competitor except these amusements and petty engrossments; they have no serious competitor except athletics. The scholar is not in the game. He keeps modestly to his class-room and his study and must be looked up and asked questions if you would know what he is thinking about. His influence can be set going only by the deliberate effort of the undergraduate himself who looks him up and stirs him. He deplores athletics and all the other absorbing and non-academic pursuits which he sees drawing the attention of his pupils off from study and serious preparation for life, but he will not enter into competition with them. He has never dreamed of such a thing; and, to tell the truth, the life of the place is organized in such a way as to make

it hardly possible for him to do so. He is therefore withdrawn and ineffectual.

It is the duty of university authorities to make of the college a society, of which the teacher will be as much, and as naturally, a member as the undergraduate. When that is done other things will fall into their natural places, their natural relations. Young men are capable of great enthusiasms for older men whom they have learned to know in some human, unartificial way, whose quality they have tasted in unconstrained conversation, the energy and beauty of whose characters and aims they have learned to appreciate by personal contact; and such enthusiasms are often among the strongest and most lasting influences of their lives. You will not gain the affection of your pupil by anything you do for him, impersonally, in the class-room. You may gain his admiration and vague appreciation, but he will tie to you only for what you have shown him personally or given him in intimate and friendly service.

Certain I am that it is impossible to rid our colleges of these things that compete with study and drive out the spirit of learning by the simple device of legislation, in which, as Americans, we have so childish a confidence; or, at least, that, if we did succeed in driving them out, did set our house in order and sweep and garnish it, other

equally distracting occupants would crowd in to take their places. For the house would be empty. There must be life as well as study. The question is, not of what are we to empty it, but with what must we fill it? We must fill it with the things of the mind and of the spirit; and that we can do by introducing into it men for whom these things are supremely interesting, the main objects of life and endeavor, teachers who will not seem pedagogues but friends, and who can by the gentle infection of friendliness make thought a general contagion. Do that; create the atmosphere and the contacts of a society made up of men young and old, mature and adolescent, serious and gay, and you will create an emulation, a saturation, a vital union of parts in a common life, in which all questions of subordination and proportion will solve themselves. So soon as the things which now dissipate and distract and dissolve our college life *feel* the things which should coördinate and regulate and inspire it in direct contact with them, *feel* their ardor and their competition, they will fall into their proper places, will become pleasures and cease to be occupations, will delight our undergraduate days, but not monopolize them. They are exaggerated now because they are separated and do not exchange impulses with those greater things of whose presence they are sometimes hardly conscious.

No doubt there are many ways in which this vital association may be effected, but all wise and successful ways will have this in common, that they will abate nothing of the freedom and self-government which have so quickened and purified our colleges in these recent days of change, will have no touch of school surveillance in them. You cannot force companionships upon undergraduates, if you treat them like men. You can only create the conditions, set up the organization, which will make them natural. The scholar should not need a statute behind him. The spirit of learning should not covet the support of the spirit and organization of the nursery. It will prevail of its own grace and power if you will but give it a chance, a conducting medium, an air in which it can move and breathe freely without effort or self-consciousness. If it cannot, I, for one, am unwilling to lend it artificial assistance. It must take its chances in the competition and win on its merits, under the ordinary rules of the game of life, where the most interesting man attracts attention, the strongest personality rules, the best organized force predominates, the most admirable thing wins allegiance. We are not seeking to force a marriage between knowledge and pleasure; we are simply trying to throw them a great deal together in the confidence that they will fall in love with one another. We are seeking to expose the undergrad-

uate when he is most susceptible to the best and most stimulating influences of the university in the hope and belief that no sensible fellow fit for a career can resist the infection.

My plea, then, is this: that we now deliberately set ourselves to make a home for the spirit of learning: that we reorganize our colleges on the lines of this simple conception, that a college is not only a body of studies but a mode of association; that its courses are only its formal side, its contacts and contagions its realities. It must become a community of scholars and pupils,—a free community but a very real one, in which democracy may work its reasonable triumphs of accommodation, its vital processes of union. I am not suggesting that young men be dragooned into becoming scholars or tempted to become pedants, or have any artificial compulsion whatever put upon them, but only that they be introduced into the high society of university ideals, be exposed to the hazards of stimulating friendships, be introduced into the easy comradeships of the republic of letters. By this means the class-room itself might some day come to seem a part of life.

INAUGURAL ADDRESS[1]

ALEXANDER MEIKLEJOHN

In the discussions concerning college education there is one voice which is all too seldom raised and all too often disregarded. It is the voice of the teacher and the scholar, of the member of the college faculty. It is my purpose to devote this address to a consideration of the ideals of the teacher, of the problems of instruction as they present themselves to the men who are giving the instruction. And I do this not because I believe that just now the teachers are wiser than others who are dealing with the same questions, but rather as an expression of a definite conviction with regard to the place of the teacher in our educational scheme. It is, I believe, the function of the teacher to stand before his pupils and before the community at large as the intellectual leader of his time. If he is not able to take this leadership, he is not worthy of his calling. If the leadership is taken from him and given to others,

[1] Delivered by the President of Amherst College, on October 16, 1912. Reprinted through the generous permission of Alexander Meiklejohn and of *The Amherst Graduates' Quarterly*.

then the very foundations of the scheme of instruction are shaken. He who in matters of teaching must be led by others is not the one to lead the imitative undergraduate, not the one to inspire the confidence and loyalty and discipleship on which all true teaching depends. If there are others who can do these things better than the college teacher of to-day, then we must bring them within the college walls. But if the teacher is to be deemed worthy of his task, then he must be recognized as the teacher of us all, and we must listen to his words as he speaks of the matters entrusted to his charge.

In the consideration of the educational creed of the teacher I will try to give, first, a brief statement of his belief; second, a defense of it against other views of the function of the college; third, an interpretation of its meaning and significance; fourth, a criticism of what seem to me misunderstandings of their own meaning prevalent among the teachers of our day; and finally, a suggestion of certain changes in policy which must follow if the belief of the teacher is clearly understood and applied in our educational procedure.

I

First, then, What do our teachers believe to be the aim of college instruction? Wherever their

opinions and convictions find expression there is one contention which is always in the foreground, namely, that to be liberal a college must be essentially intellectual. It is a place, the teachers tell us, in which a boy, forgetting all things else, may set forth on the enterprise of learning. It is a time when a young man may come to awareness of the thinking of his people, may perceive what knowledge is and has been and is to be. Whatever light-hearted undergraduates may say, whatever the opinions of solicitous parents, of ambitious friends, of employers in search of workmen, of leaders in church or state or business,—whatever may be the beliefs and desires and demands of outsiders,—the teacher within the college, knowing his mission as no one else can know it, proclaims that mission to be the leading of his pupil into the life intellectual. (The college is primarily not a place of the body, nor of the feelings, nor even of the will; it is, first of all, a place of the mind.)

II

Against this intellectual interpretation of the college our teachers find two sets of hostile forces constantly at work. Outside the walls there are the practical demands of a busy commercial and social scheme; within the college there are the trivial and sentimental and irrational misunder-

standings of its own friends. Upon each of these our college teachers are wont to descend as Samson upon the Philistines, and when they have had their will, there is little left for another to accomplish.

As against the immediate practical demands from without, the issue is clear and decisive. College teachers know that the world must have trained workmen, skilled operatives, clever buyers and sellers, efficient directors, resourceful manufacturers, able lawyers, ministers, physicians, and teachers. But it is equally true that in order to do its own work, the liberal college must leave the special and technical training for these trades and professions to be done in other schools and by other methods. In a word, the liberal college does not pretend to give all the kinds of teaching which a young man of college age may profitably receive; it does not even claim to give all the kinds of intellectual training which are worth giving. It is committed to intellectual training of the liberal type, whatever that may mean, and to that mission it must be faithful. One may safely say, then, on behalf of our college teachers, that their instruction is intended to be radically different from that given in the technical school or even in the professional school. Both these institutions are practical in a sense which the college, as an intellectual institution, is not. In the technical school

the pupil is taught how to do some one of the mechanical operations which contribute to human welfare. He is trained to print, to weave, to farm, to build; and for the most part he is trained to do these things by practice rather than by theory. His possession when he leaves the school is not a stock of ideas, of scientific principles, but a measure of skill, a collection of rules of thumb. His primary function as a tradesman is not to understand but to do, and in doing what is needed he is following directions which have first been thought out by others and are now practised by him. The technical school intends to furnish training which, in the sense in which we use the term, is not intellectual but practical.

In a corresponding way the work of the professional school differs from that of the liberal college. In the teaching of engineering, medicine, or law we are or may be beyond the realm of mere skill and within the realm of ideas and principles. But the selection and the relating of these ideas is dominated by an immediate practical interest which cuts them off from the intellectual point of view of the scholar. If an undergraduate should take away from his studies of chemistry, biology, and psychology only those parts which have immediate practical application in the field of medicine, the college teachers would feel that they had failed to give to the boy the kind of

instruction demanded of a college. It is not their purpose to furnish applied knowledge in this sense. They are not willing to cut up their sciences into segments and to allow the student to select those segments which may be of service in the practice of an art or a profession. In one way or another the teacher feels a kinship with the scientist and the scholar which forbids him to submit to this domination of his instruction by the demands of an immediate practical interest. Whatever it may mean, he intends to hold the intellectual point of view and to keep his students with him if he can. In response, then, to demands for technical and professional training our college teachers tell us that such training may be obtained in other schools; it is not to be had in a college of liberal culture.

In the conflict with the forces within the college our teachers find themselves fighting essentially the same battle as against the foes without. In a hundred different ways the friends of the college, students, graduates, trustees, and even colleagues, seem to them so to misunderstand its mission as to minimize or to falsify its intellectual ideals. The college is a good place for making friends; it gives excellent experience in getting on with men; it has exceptional advantages as an athletic club; it is a relatively safe place for a boy when he first leaves home; on the whole it may

improve a student's manners; it gives acquaintance with lofty ideals of character, preaches the doctrine of social service, exalts the virtues and duties of citizenship. All these conceptions seem to the teacher to hide or to obscure the fact that the college is fundamentally a place of the mind, a time for thinking, an opportunity for knowing. And perhaps in proportion to their own loftiness of purpose and motive they are the more dangerous as tending all the more powerfully to replace or to nullify the underlying principle upon which they all depend. Here again when misconception clears away, one can have no doubt that the battle of the teacher is a righteous one. It is well that a boy should have four good years of athletic sport, playing his own games and watching the games of his fellows; it is well that his manners should be improved; it is worth while to make good friends; it is very desirable to develop the power of understanding and working with other men; it is surely good to grow in strength and purity of character, in devotion to the interests of society, in readiness to meet the obligations and opportunities of citizenship. If any one of these be lacking from the fruits of a college course we may well complain of the harvest. And yet is it not true that by sheer pressure of these, by the driving and pulling of the social forces within and without the college, the mind of the student is constantly

torn from its chief concern? Do not our social and practical interests distract our boys from the intellectual achievements which should dominate their imagination and command their zeal? I believe that one may take it as the deliberate judgment of the teachers of our colleges to-day that the function of the college is constantly misunderstood, and that it is subjected to demands which, however friendly in intent, are yet destructive of its intellectual efficiency and success.

III

But now that the contention of the teacher has been stated and reaffirmed against objections, it is time to ask, What does it mean? And how can it be justified? By what might does a company of scholars invite young men to spend with them four years of discipleship? Do they, in their insistence upon the intellectual quality of their ideal, intend to give an education which is avowedly unpractical? If so, how shall they justify their invitation, which may perhaps divert young men from other interests and other companionships which are valuable to themselves and to their fellows? In a word, what is the underlying motive of the teacher, what is there in the intellectual interests and activities which seems to him to warrant their domination over the training

and instruction of young men during the college years?

It is no fair answer to this question to summon us to faith in intellectual ideals, to demand of us that we live the life of the mind with confidence in the virtues of intelligence, that we love knowledge and because of our passion follow after it. Most of us are already eager to accept intellectual ideals, but our very devotion to them forbids that we accept them blindly. I have often been struck by the inner contradictoriness of the demand that we have faith in intelligence. It seems to mean, as it is so commonly made to mean, that we must unintelligently follow intelligence, that we must ignorantly pursue knowledge, that we must question everything except the business of asking questions, that we think about everything except the use of thinking itself. As Mr. F. H. Bradley would say, the dictum, "Have faith in intelligence," is so true that it constantly threatens to become false. Our very conviction of its truth compels us to scrutinize and test it to the end.

How then shall we justify the faith of the teacher? What reason can we give for our exaltation of intellectual training and activity? To this question two answers are possible. First, knowledge and thinking are good in themselves. Secondly, they help us in the attainment of other values in life which without them would be im-

possible. Both these answers may be given and are given by college teachers. Within them must be found whatever can be said by way of explanation and justification of the work of the liberal college.

The first answer receives just now far less of recognition than it can rightly claim. When the man of the world is told that a boy is to be trained in thinking just because of the joys and satisfactions of thinking itself, just in order that he may go on thinking as long as he lives, the man of the world has been heard to scoff and to ridicule the idle dreaming of scholarly men. But if thinking is not a good thing in itself, if intellectual activity is not worth while for its own sake, will the man of the world tell us what is? There are those among us who find so much satisfaction in the countless trivial and vulgar amusements of a crude people that they have no time for the joys of the mind. There are those who are so closely shut up within a little round of petty pleasures that they have never dreamed of the fun of reading and conversing and investigating and reflecting. And of these one can only say that the difference is one of taste, and that their tastes seem to be relatively dull and stupid. Surely it is one function of the liberal college to save boys from that stupidity, to give them an appetite for the pleasures of thinking, to make them sensitive to the

joys of appreciation and understanding, to show them how sweet and captivating and wholesome are the games of the mind. At the time when the play element is still dominant it is worth while to acquaint boys with the sport of facing and solving problems. Apart from some of the experiences of friendship and sympathy I doubt if there are any human interests so permanently satisfying, so fine and splendid in themselves as are those of intellectual activity. (To give our boys that zest, that delight in things intellectual, to give them an appreciation of a kind of life which is well worth living, to make them men of intellectual culture—that certainly is one part of the work of any liberal college.)

On the other hand, the creation of culture as so defined can never constitute the full achievement of the college. It is essential to awaken the impulses of inquiry, of experiment, of investigation, of reflection, the instinctive cravings of the mind. But no liberal college can be content with this. The impulse to thinking must be questioned and rationalized as must every other instinctive response. It is well to think, but what shall we think about? Are there any lines of investigation and reflection more valuable than others, and if so, how is their value to be tested? Or again, if the impulse for thinking comes into conflict with other desires and cravings, how is the opposition to be

solved? It has sometimes been suggested that our man of intellectual culture may be found like Nero fiddling with words while all the world about him is aflame. And the point of the suggestion is not that fiddling is a bad and worthless pastime, but rather that it is inopportune on such an occasion, that the man who does it is out of touch with his situation, that his fiddling does not fit his facts. In a word, men know with regard to thinking, as with regard to every other content of human experience, that it cannot be valued merely in terms of itself. It must be measured in terms of its relation to other contents and to human experience as a whole. Thinking is good in itself,—but what does it cost of other things, what does it bring of other values? Place it amid all the varied contents of our individual and social experience, measure it in terms of what it implies, fix it by means of its relations, and then you will know its worth not simply in itself but in that deeper sense which comes when human desires are rationalized and human lives are known in their entirety, as well as they can be known by those who are engaged in living them.

In this consideration we find the second answer of the teacher to the demand for justification of the work of the college. Knowledge is good, he tells us, not only in itself, but in its enrichment and enhancement of the other values of our ex-

perience. In the deepest and fullest sense of the words, knowledge pays. This statement rests upon the classification of human actions into two groups, those of the instinctive type and those of the intellectual type. By far the greater part of our human acts are carried on without any clear idea of what we are going to do or how we are going to do it. For the most part our responses to our situations are the immediate responses of feeling, of perception, of custom, of tradition. But slowly and painfully, as the mind has developed, action after action has been translated from the feeling to the ideational type; in wider and wider fields men have become aware of their own modes of action, more and more they have come to understanding, to knowledge of themselves and of their needs. And the principle underlying all our educational procedure is that on the whole, actions become more successful as they pass from the sphere of feeling to that of understanding. Our educational belief is that in the long run if men know what they are going to do and how they are going to do it, and what is the nature of the situation with which they are dealing, their response to that situation will be better adjusted and more beneficial than are the responses of the feeling type in like situations.

It is all too obvious that there are limits to the validity of this principle. If men are to investi-

gate, to consider, to decide, then action must be delayed and we must pay the penalty of waiting. If men are to endeavor to understand and know their situations, then we must be prepared to see them make mistakes in their thinking, lose their certainty of touch, wander off into pitfalls and illusions and fallacies of thought, and in consequence secure for the time results far lower in value than those of the instinctive response which they seek to replace. The delays and mistakes and uncertainties of our thinking are a heavy price to pay, but it is the conviction of the teacher that the price is as nothing when compared with the goods which it buys. You may point out to him the loss when old methods of procedure give way before the criticism of understanding, you may remind him of the pain and suffering when old habits of thought and action are replaced, you may reprove him for all the blunders of the past; but in spite of it all he knows and you know that in human lives taken separately and in human life as a whole men's greatest lack is the lack of understanding, their greatest hope to know themselves and the world in which they live.

Within the limits of this general educational principle the place of the liberal college may easily be fixed. In the technical school pupils are prepared for a specific work and are kept for the most part on the plane of perceptual action,

doing work which others understand. In the professional school, students are properly within the realm of ideas and principles, but they are still limited to a specific human interest with which alone their understanding is concerned. But the college is called liberal as against both of these because the instruction is dominated by no special interest, is limited to no single human task, but is intended to take human activity as a whole, to understand human endeavors not in their isolation but in their relations to one another and to the total experience which we call the life of our people. And just as we believe that the building of ships has become more successful as men have come to a knowledge of the principles involved in their construction; just as the practice of medicine has become more successful as we have come to a knowledge of the human body, of the conditions within it and the influences without;—just so the teacher in the liberal college believes that life as a total enterprise, life as it presents itself to each one of us in his career as an individual,—human living,—will be more successful in so far as men come to understand it and to know it as they attempt to carry it on. To give boys an intellectual grasp on human experience—this it seems to me is the teacher's conception of the chief function of the liberal college.

May I call attention to the fact that this second

answer of the teacher defines the aim of the college as avowedly and frankly practical. Knowledge is to be sought chiefly for the sake of its contribution to the other activities of human living. But on the other hand, it is as definitely declared that in method the college is fully and unreservedly intellectual. If we can see that these two demands are not in conflict but that they stand together in the harmonious relation of means and ends, of instrument and achievement, of method and result, we may escape many a needless conflict and keep our educational policy in singleness of aim and action. To do this we must show that the college is intellectual, not as opposed to practical interests and purposes, but as opposed to unpractical and unwise methods of work. The issue is not between practical and intellectual aims but between the immediate and the remote aim, between the hasty and the measured procedure, between the demand for results at once and the willingness to wait for the best results. The intellectual road to success is longer and more roundabout than any other, but they who are strong and willing for the climbing are brought to higher levels of achievement than they could possibly have attained had they gone straight forward in the pathway of quick returns. If this were not true the liberal college would have no proper place in our life at all. In so far as it is true the college has a right to claim

the best of our young men to give them its preparation for the living they are to do.

IV

But now that we have attempted to interpret the intellectual mission of the college, it may be fair to ask, "Are the teachers and scholars of our day always faithful to that mission? Do their statements and their practice always ring in accord with the principle which has been stated?" It seems to me that at two points they are constantly off the key, constantly at variance with the reasons by which alone their teaching can be justified.

In the first place, it often appears as if our teachers and scholars were deliberately in league to mystify and befog the popular mind regarding this practical value of intellectual work. They seem not to wish too much said about the results and benefits. Their desire is to keep aloft the intellectual banner, to proclaim the intellectual gospel, to demand of student and public alike adherence to the faith. And in general when they are questioned as to results they give little satisfaction except to those who are already pledged to unwavering confidence in their *ipse dixits*. And largely as a result of this attitude the American people seem to me to have little understanding

of the intellectual work of the college. Our citizens and patrons can see the value of games and physical exercises; they readily perceive the importance of the social give and take of a college democracy; they can appreciate the value of studies which prepare a young man for his profession and so anticipate or replace the professional school; they can even believe that if a boy is kept at some sort of thinking for four years his mind may become more acute, more systematic, more accurate, and hence more useful than it was before. But as for the content of a college course, as for the value of knowledge, what a boy gains by knowing Greek or economics, philosophy or literature, history or biology, except as they are regarded as having professional usefulness, I think our friends are in the dark and are likely to remain so until we turn on the light. When our teachers say, as they sometimes do say, that the effect of knowledge upon the character and life of the student must always be for the college an accident, a circumstance which has no essential connection with its real aim or function, then it seems to me that our educational policy is wholly out of joint. If there be no essential connection between instruction and life, then there is no reason for giving instruction except in so far as it is pleasant in itself, and we have no educational policy at all. As against this hesitancy, this absence of a con-

viction, we men of the college should declare in clear and unmistakable terms our creed—the creed that knowledge is justified by its results. We should say to our people so plainly that they cannot misunderstand, "Give us your boys, give us the means we need, and we will so train and inform the minds of those boys that their own lives and the lives of the men about them shall be more successful than they could be without our training. Give us our chance and we will show your boys what human living is, for we are convinced that they can live better in knowledge than they can in ignorance."

There is a second wandering from the faith which is so common among investigators that it may fairly be called the "fallacy of the scholar." It is the belief that all knowledge is so good that all parts of knowledge are equally good. Ask many of our scholars and teachers what subjects a boy should study in order that he may gain insight for human living, and they will say, "It makes no difference in what department of knowledge he studies; let him go into Sanscrit or bacteriology, into mathematics or history; if only he goes where men are actually dealing with intellectual problems, and if only he learns how to deal with problems himself, the aim of education is achieved, he has entered into intellectual activity." This point of view, running through all the varie-

ties of the elective system, seems to me hopelessly at variance with any sound educational doctrine. It represents the scholar of the day at his worst both as a thinker and as a teacher. In so far as it dominates a group of college teachers it seems to me to render them unfit to determine and to administer a college curriculum. It is an announcement that they have no guiding principles in their educational practice, no principles of selection in their arrangement of studies, no genuine grasp on the relationship between knowledge and life. It is the concerted statement of a group of men each of whom is lost within the limits of his own special studies, and who as a group seem not to realize the organic relationships between them nor the common task which should bind them together.

In bringing this second criticism against our scholars I am not urging that the principle of election of college studies should be entirely discontinued. But I should like to inquire by what right and within what limits it is justified. The most familiar argument in its favor is that if a student is allowed to choose along the lines of his own intellectual or professional interest he will have enthusiasm, the eagerness which comes with the following of one's own bent. Now just so far as this result is achieved, just so far as the quality of scholarship is improved, the procedure is good

and we may follow it if we do not thereby lose other results more valuable than our gain. But if the special interest comes into conflict with more fundamental ones, if what the student prefers is opposed to what he ought to prefer, then we of the college cannot leave the choice with him. We must say to him frankly, "If you do not care for liberal training you had better go elsewhere; we have a special and definite task assigned us which demands that we keep free from the domination of special or professional pursuits. So long as we are faithful to that task we cannot give you what you ask."

In my opinion, however, the fundamental motive of the elective system is not the one which has been mentioned. In the last resort our teachers allow students to choose their own studies not in order to appeal to intellectual or to professional interest, but because they themselves have no choice of their own in which they believe with sufficient intensity to impose it upon their pupils. And this lack of a dominating educational policy is in turn an expression of an intellectual attitude, a point of view, which marks the scholars of our time. In a word, it seems to me that our willingness to allow students to wander about in the college curriculum is one of the most characteristic expressions of a certain intellectual agnosticism, a kind of intellectual bankruptcy, into which, in

spite of all our wealth of information, the spirit of the time has fallen. Let me explain my meaning.

The old classical curriculum was founded by men who had a theory of the world and of human life. They had taken all the available content of human knowledge and had wrought it together into a coherent whole. What they knew was, as judged by our standards, very little in amount. But upon that little content they had expended all the infinite pains of understanding and interpretation. They had taken the separate judgments of science, philosophy, history, and the arts, and had so welded them together, so established their relationships with one another, so freed them from contradictions and ambiguities that, so far as might be in their day and generation, human life as a whole and the world about us were known, were understood, were rationalized. They had a knowledge of human experience by which they could live and which they could teach to others engaged in the activities of living.

But with the invention of methods of scientific investigation and discovery there came pouring into the mind of Europe great masses of intellectual material,—astronomy, physics, chemistry. This content for a time it could not understand, could not relate to what it already knew. The old boundary lines did not enclose the new fields,

the old explanations and interpretations would not fit the new facts. Knowledge had not grown, it had simply been enlarged, and the two masses of content, the old and the new, stood facing each other with no common ground of understanding. Here was the intellectual task of the great leaders of the early modern thought of Europe: to re-establish the unity of knowledge, to discover the relationships between these apparently hostile bodies of judgments, to know the world again, but with all the added richness of the new insights and the new information. This was the work of Leibnitz and Spinoza, of Kant and Hegel, and those who labored with them. And in a very considerable measure the task had been accomplished, order had been restored. But again with the inrush of the newer discoveries, first in the field of biology and then later in the world of human relationships, the difficulties have returned, multiplied a thousand fold. Every day sees a new field of facts opened up, a new method of investigation invented, a new department of knowledge established. And in the rush of it all these new sciences come merely as additions, not to be understood but simply numbered, not to be interpreted but simply listed in the great collection of separate fields of knowledge. If you will examine the work of any scientist within one of these fields you will find him ordering, systematizing, reducing to principles, in a word,

knowing every fact in terms of its relation to every other fact and to the whole field within which it falls. But at the same time these separate sciences, these separate groups of judgment, are left standing side by side with no intelligible connections, no establishment of relationships, no interpretation in the sense in which we insist upon it with each of the fields taken by itself. Is it not the characteristic statement of a scholar of our time to say, " I do not know what may be the ultimate significance of these facts and these principles; all that I know is that if you will follow my methods within my field you will find the facts coming into order, the principles coming into simple and coherent arrangement. With any problems apart from this order and this arrangement I have intellectually no concern."

It has become an axiom with us that the genuine student labors within his own field. And if the student ventures forth to examine the relations of his field to the surrounding country he very easily becomes a popularizer, a litterateur, a speculator, and worst of all, unscientific. Now I do not object to a man's minding his own intellectual business if he chooses to do so, but when a man minds his own business because he does not know any other business, because he has no knowledge whatever of the relationships which justify his business and make it worth while, then I think one

may say that though such a man minds his own affairs he does not know them, he does not understand them. Such a man, from the point of view of the demands of a liberal education, differs in no essential respect from the tradesman who does not understand his trade or the professional man who merely practices his profession. Just as truly as they, he is shut up within a special interest; just as truly as they he is making no intellectual attempt to understand his experience in its unity. And the pity of it is that more and more the chairs in our colleges are occupied by men who have only this special interest, this specialized information, and it is through them that we attempt to give our boys a liberal education, which the teachers themselves have not achieved.

I should not like to be misunderstood in making this railing accusation against our teachers and our time. If I say that our knowledge is at present a collection of scattered observations about the world rather than an understanding of it, fairness compels the admission that the failure is due to the inherent difficulties of the situation and to the novelty of the problems presented. If I cry out against the agnosticism of our people it is not as one who has escaped from it, nor as one who would point the way back to the older synthesis, but simply as one who believes that the time has come for a reconstruction, for a new synthesis.

We have had time enough now to get some notion of our bearings, shocks enough to get over our nervousness and discomfiture when a new one comes along. It is the opportunity and the obligation of this generation to think through the content of our knowing once again, to understand it, so far as we can. And in such a battle as this, surely it is the part of the college to take the lead. Here is the mission of the college teacher as of no other member of our common life. Surely he should stand before his pupils and before all of us as a man who has achieved some understanding of this human situation of ours, but more than that, as one who is eager for the conflict with the powers of darkness and who can lead his pupils in enthusiastic devotion to the common cause of enlightenment.

V

And now, finally, after these attacks upon the policies which other men have derived from their love of knowledge, may I suggest two matters of policy which seem to me to follow from the definition of education which we have taken. The first concerns the content of the college course; the second has to do with the method of its presentation to the undergraduate.

We have said that the system of free election is natural for those to whom knowledge is simply a

number of separate departments. It is equally true that just in so far as knowledge attains unity, just so far as the relations of the various departments are perceived, freedom of election by the student must be limited. For it at once appears that on the one side there are vast ranges of information which have virtually no significance for the purposes of a liberal education, while on the other hand there are certain elements so fundamental and vital that without any one of them a liberal education is impossible.

I should like to indicate certain parts of human knowledge which seem to me so essential that no principle of election should ever be allowed to drive them out of the course of any college student.

First, a student should become acquainted with the fundamental motives and purposes and beliefs which, clearly or unclearly recognized, underlie all human experience and bind it together. He must perceive the moral strivings, the intellectual endeavors, the æsthetic experiences of his race, and closely linked with these, determining and determined by them, the beliefs about the world which have appeared in our systems of religion. To investigate this field, to bring it to such clearness of formulation as may be possible, is the task of philosophy—an essential element in any liberal education. Secondly, as in human living, our motives, purposes, and beliefs have found expression

in institutions,—those concerted modes of procedure by which we work together,—a student should be made acquainted with these. He should see and appreciate what is intended, what accomplished, and what left undone by such institutions as property, the courts, the family, the church, the mill. To know these as contributing and failing to contribute to human welfare is the work of our social or humanistic sciences, into which a boy must go on his way through the liberal college. Thirdly, in order to understand the motives and the institutions of human life one must know the conditions which surround it, the stage on which the game is played. To give this information is the business of astronomy, geology, physics, chemistry, biology and the other descriptive sciences. These a boy must know, so far as they are significant and relevant to his purpose. Fourthly, as all three of these factors, the motives, the institutions, the natural processes have sprung from the past and have come to be what they are by change upon change in the process of time, the student of human life must try to learn the sequence of events from which the present has come. The development of human thought and attitude, the development of human institutions, the development of the world and of the beings about us—all these must be known, as throwing light upon present problems, present instrumental-

ities, present opportunities in the life of human endeavor. And in addition to these four studies which render human experience in terms of abstract ideas, a liberal education must take account of those concrete representations of life which are given in the arts, and especially in the art of literature. It is well that a boy should be acquainted with his world not simply as expressed by the principles of knowledge but also as depicted by the artist with all the vividness and definiteness which are possible in the portrayal of individual beings in individual relationships. These five elements, then, a young man must take from a college of liberal training, the contributions of philosophy, of humanistic science, of natural science, of history, and of literature. So far as knowledge is concerned, these at least he should have, welded together in some kind of interpretation of his own experience and of the world in which he lives.

My second suggestion is that our college curriculum should be so arranged and our instruction so devised that its vital connection with the living of men should be obvious even to an undergraduate. A little while ago I heard one of the most prominent citizens of this country speaking of his college days, and he said, "I remember so vividly those few occasions on which the professor would put aside the books and talk like a real man

about real things." Oh, the bitterness of those words to the teacher! Our books are not dealing with the real things, and for the most part we are not real men either, but just old fogies and bookworms. And to be perfectly frank about the whole matter, I believe that in large measure our pupils are indifferent to their studies simply because they do not see that these are important.

Now if we really have a vital course of study to present I believe that this difficulty can in large measure be overcome. It is possible to make a freshman realize the need of translating his experience from the forms of feeling to those of ideas. He can and he ought to be shown that now, his days of mere tutelage being over, it is time for him to face the problems of his people, to begin to think about those problems for himself, to learn what other men have learned and thought before him, in a word, to get himself ready to take his place among those who are responsible for the guidance of our common life by ideas and principles and purposes. If this could be done, I think we should get from the reality-loving American boy something like an intellectual enthusiasm, something of the spirit that comes when he plays a game that seems to him really worth playing. But I do not believe that this result can be achieved without a radical reversal of the arrangement of the college curriculum. I should like to

see every freshman at once plunged into the problems of philosophy, into the difficulties and perplexities about our institutions, into the scientific accounts of the world especially as they bear on human life, into the portrayals of human experience which are given by the masters of literature. If this were done by proper teaching, it seems to me the boy's college course would at once take on significance for him; he would understand what he is about; and though he would be a sadly puzzled boy at the end of the first year, he would still have before him three good years of study, of investigation, of reflection, and of discipleship, in which to achieve, so far as may be, the task to which he has been set. Let him once feel the problems of the present, and his historical studies will become significant; let him know what other men have discovered and thought about his problems, and he will be ready to deal with them himself. But in any case, the whole college course will be unified and dominated by a single interest, a single purpose,—that of so understanding human life as to be ready and equipped for the practice of it. And this would mean for the college, not another seeking of the way of quick returns, but rather an escape from aimless wanderings in the mere by-paths of knowledge, a resolute climbing on the high road to a unified grasp upon human experience.

I have taken so much of your time this morning that an apology seems due for the things I have omitted to mention. I have said nothing of the organization of the college, nothing of the social life of the students, nothing of the relations with the alumni, nothing of the needs and qualifications of the teachers, and even within the consideration of the course of study, nothing of the value of specialization or of the disciplinary subjects or of the training in language and expression. And I have put these aside deliberately, for the sake of a cause which is greater than any of them —a cause which lies at the very heart of the liberal college. It is the cause of making clear to the American people the mission of the teacher, of convincing them of the value of knowledge: not the specialized knowledge which contributes to immediate practical aims, but the unified understanding which is Insight.

KNOWLEDGE VIEWED IN RELATION TO LEARNING[1]

JOHN HENRY NEWMAN

It were well if the English, like the Greek language, possessed some definite word to express, simply and generally, intellectual proficiency or perfection, such as "health," as used with reference to the animal frame, and "virtue," with reference to our moral nature. I am not able to find such a term;—talent, ability, genius, belong distinctly to the raw material, which is the subject-matter, not to that excellence which is the result of exercise and training. When we turn, indeed, to the particular kinds of intellectual perfection, words are forthcoming for our purpose, as, for instance, judgment, taste, and skill; yet even these belong, for the most part, to powers or habits bearing upon practice or upon art, and not to any perfect condition of the intellect, considered in itself. Wisdom, again, is certainly a more comprehensive word than any other, but it has a direct

[1] The sixth of a series of nine *Discourses on University Teaching* delivered to the Catholics of Dublin in 1852.

relation to conduct, and to human life. Knowledge, indeed, and Science express purely intellectual ideas, but still not a state or quality of the intellect; for knowledge, in its ordinary sense, is but one of its circumstances, denoting a possession or a habit; and science has been appropriated to the subject-matter of the intellect, instead of belonging in English, as it ought to do, to the intellect itself. The consequence is that, on an occasion like this, many words are necessary, in order, first, to bring out and convey what surely is no difficult idea in itself,—that of the cultivation of the intellect as an end; next, in order to recommend what surely is no unreasonable object; and lastly, to describe and make the mind realize the particular perfection in which that object consists. Every one knows practically what are the constituents of health or of virtue; and every one recognizes health and virtue as ends to be pursued; it is otherwise with intellectual excellence, and this must be my excuse, if I seem to any one to be bestowing a good deal of labor on a preliminary matter.

In default of a recognized term, I have called the perfection or virtue of the intellect by the name of philosophy, philosophical knowledge, enlargement of mind, or illumination; terms which are not uncommonly given to it by writers of this day: but, whatever name we bestow on it, it is, I

believe, as a matter of history, the business of a University to make this intellectual culture its direct scope, or to employ itself in the education of the intellect,—just as the work of a Hospital lies in healing the sick or wounded, of a Riding or Fencing School, or of a Gymnasium, in exercising the limbs, of an Almshouse, in aiding and solacing the old, of an Orphanage, in protecting innocence, of a Penitentiary, in restoring the guilty. I say, a University, taken in its bare idea, and before we view it as an instrument of the Church, has this object and this mission; it contemplates neither moral impression nor mechanical production; it professes to exercise the mind neither in art nor in duty; its function is intellectual culture; here it may leave its scholars, and it has done its work when it has done as much as this. It educates the intellect to reason well in all matters, to reach out towards truth, and to grasp it.

This, I said in my foregoing Discourse, was the object of a University, viewed in itself, and apart from the Catholic Church, or from the State, or from any other power which may use it; and I illustrated this in various ways. I said that the intellect must have an excellence of its own, for there was nothing which had not its specific good; that the word "educate" would not be used of intellectual culture, as it is used, had not the intellect had an end of its own; that, had it not

such an end, there would be no meaning in calling certain intellectual exercises "liberal," in contrast with "useful," as is commonly done; that the very notion of a philosophical temper implied it, for it threw us back upon research and system as ends in themselves, distinct from effects and works of any kind; that a philosophical scheme of knowledge, or system of sciences, could not, from the nature of the case, issue in any one definite art or pursuit, as its end; and that, on the other hand, the discovery and contemplation of truth, to which research and systematizing led, were surely sufficient ends, though nothing beyond them were added, and that they had ever been accounted sufficient by mankind.

Here then I take up the subject; and, having determined that the cultivation of the intellect is an end distinct and sufficient in itself, and that, so far as words go it is an enlargement or illumination, I proceed to inquire what this mental breadth, or power, or light, or philosophy consists in. A Hospital heals a broken limb or cures a fever: what does an Institution effect, which professes the health, not of the body, not of the soul, but of the intellect? What is this good, which in former times, as well as our own, has been found worth the notice, the appropriation, of the Catholic Church?

I have then to investigate, in the Discourses

which follow, those qualities and characteristics of the intellect in which its cultivation issues or rather consists; and, with a view of assisting myself in this undertaking, I shall recur to certain questions which have already been touched upon. These questions are three: viz., the relation of intellectual culture, first, to *mere* knowledge; secondly, to *professional* knowledge; and thirdly, to *religious* knowledge. In other words, are *acquirements* and *attainments* the scope of a University Education? or *expertness in particular arts and pursuits?* or *moral and religious proficiency?* or something besides these three? These questions I shall examine in succession, with the purpose I have mentioned; and I hope to be excused, if, in this anxious undertaking, I am led to repeat what, either in these Discourses or elsewhere, I have already put upon paper. And first, of *Mere Knowledge*, or Learning, and its connection with intellectual illumination or Philosophy.

I suppose the *primâ-facie* view which the public at large would take of a University, considering it as a place of Education, is nothing more or less than a place for acquiring a great deal of knowledge on a great many subjects. Memory is one of the first developed of the mental facilities; a boy's business when he goes to school is to learn, that is, to store up things in his memory. For many years his intellect is little more than an in-

strument for taking in facts, or a receptacle for storing them; he welcomes them as fast as they come to him; he lives on what is without; he has his eyes ever about him; he has a lively susceptibility of impressions; he imbibes information of every kind; and little does he make his own in a true sense of the word, living rather upon his neighbors all around him. He has opinions, religious, political, and literary, and, for a boy, is very positive in them and sure about them; but he gets them from his school-fellows, or his masters, or his parents, as the case may be. Such as he is in his other relations, such also is he in his school exercises; his mind is observant, sharp, ready, retentive; he is almost passive in the acquisition of knowledge. I say this in no disparagement of the idea of a clever boy. Geography, chronology, history, language, natural history, he heaps up the matter of these studies as treasures for a future day. It is the seven years of plenty with him: he gathers in by handfuls, like the Egyptians, without counting; and though, as time goes on, there is exercise for his argumentative powers in the Elements of Mathematics, and for his taste in the Poets and Orators, still, while at school, or at least, till quite the last years of his time, he acquires, and little more; and when he is leaving for the University he is mainly the creature of foreign influences and circumstances, and made up of ac-

cidents, homogeneous or not, as the case may be. Moreover, the moral habits, which are a boy's praise, encourage and assist this result; that is, diligence, assiduity, regularity, despatch, persevering application; for these are the direct conditions of acquisition, and naturally lead to it. Acquirements, again, are emphatically producible, and at a moment; they are a something to show, both for master and scholar; an audience, even though ignorant themselves of the subjects of an examination, can comprehend when questions are answered and when they are not. Here again is a reason why mental culture is in the minds of men identified with the acquisition of knowledge.

The same notion possesses the public mind, when it passes on from the thought of a school to that of a University: and with the best of reasons so far as this, that there is no true culture without requirements, and that philosophy presupposes knowledge. It requires a great deal of reading, or a wide range of information, to warrant us in putting forth our opinions on any serious subject; and without such learning the most original mind may be able indeed to dazzle, to amuse, to refute, to perplex, but not to come to any useful result or any trustworthy conclusion. There are indeed persons who profess a different view of the matter, and even act upon it. Every now and then you will find a person of vigorous or fertile mind,

who relies upon his own resources, despises all former authors, and gives the world, with the utmost fearlessness, his views upon religion, or history, or any other popular subject. And his works may sell for a while; he may get a name in his day; but this will be all. His readers are sure to find on the long run that his doctrines are mere theories, and not the expression of facts, that they are chaff instead of bread, and then his popularity drops as suddenly as it rose.

Knowledge then is the indispensable condition of expansion of mind, and the instrument of attaining to it; this cannot be denied, it is ever to be insisted on; I begin with it as a first principle; however, the very truth of it carries men too far, and confirms to them the notion that it is the whole of the matter. A narrow mind is thought to be that which contains little knowledge; and an enlarged mind, that which holds a great deal; and what seems to put the matter beyond dispute is, the fact of the great number of studies which are pursued in a University, by its very profession. Lectures are given on every kind of subject; examinations are held; prizes awarded. There are moral, metaphysical, physical Professors; Professors of languages, of history, of mathematics, of experimental science. Lists of questions are published, wonderful for their range and depth, variety and difficulty; treatises are

written, which carry upon their very face the evidence of extensive reading or multifarious information; what then is wanting for mental culture to a person of large reading and scientific attainments? what is grasp of mind but acquirement? where shall philosophical repose be found, but in the consciousness and enjoyment of large intellectual possessions?

And yet this notion is, I conceive, a mistake, and my present business is to show that it is one, and that the end of a Liberal Education is not mere knowledge, or knowledge considered in its *matter;* and I shall best attain my object, by actually setting down some cases, which will be generally granted to be instances of the process of enlightenment or enlargement of mind, and others which are not, and thus, by the comparison, you will be able to judge for yourselves, Gentlemen, whether Knowledge, that is, acquirement, is after all the real principle of the enlargement, or whether that principle is not rather something beyond it.

For instance, let a person, whose experience has hitherto been confined to the more calm and unpretending scenery of these islands, whether here or in England, go for the first time into parts where physical nature puts on her wilder and more awful forms, whether at home or abroad, as into mountainous districts; or let one, who has ever

lived in a quiet village, go for the first time to a great metropolis,—then I suppose he will have a sensation which perhaps he never had before. He has a feeling not in addition or increase of former feelings, but of something different in its nature. He will perhaps be borne forward, and find for a time that he has lost his bearings. He has made a certain progress, and he has a consciousness of mental enlargement; he does not stand where he did, he has a new centre, and a range of thoughts to which he was before a stranger.

Again, the view of the heavens which the telescope opens upon us, if allowed to fill and possess the mind, may almost whirl it round and make it dizzy. It brings in a flood of ideas, and is rightly called an intellectual enlargement, whatever is meant by the term.

And so again, the sight of beasts of prey and other foreign animals, their strangeness, the originality (if I may use the term) of their forms and gestures and habits and their variety and independence of each other, throw us out of ourselves into another creation, and as if under another Creator, if I may so express the temptation which may come on the mind. We seem to have new faculties, or a new exercise for our faculties, by this addition to our knowledge; like a prisoner, who, having been accustomed to wear manacles or fetters, suddenly finds his arms and legs free.

Hence Physical Science generally, in all its departments, as bringing before us the exuberant riches and resources, yet the orderly course, of the Universe, elevates and excites the student, and at first, I may say, almost takes away his breath, while in time it exercises a tranquilizing influence upon him.

Again, the study of history is said to enlarge and enlighten the mind, and why? because, as I conceive, it gives it a power of judging of passing events, and of all events, and a conscious superiority over them, which before it did not possess.

And in like manner, what is called seeing the world, entering into active life, going into society, traveling, gaining acquaintance with the various classes of the community, coming into contact with the principles and modes of thought of various parties, interests, and races, their views, aims, habits, and manners, their religious creeds and forms of worship,—gaining experience how various yet how alike men are, how low-minded, how bad, how opposed, yet how confident in their opinions; all this exerts a perceptible influence upon the mind, which it is impossible to mistake, be it good or be it bad, and is popularly called its enlargement.

And then again, the first time the mind comes across the arguments and speculations of unbelievers, and feels what a novel light they cast upon

what it has hitherto accounted sacred; and still more, if it gives in to them and embraces them, and throws off as so much prejudice what it has hitherto held, and, as if waking from a dream, begins to realize to its imagination that there is now no such thing as law and the transgression of law, that sin is a phantom, and punishment a bugbear, that it is free to sin, free to enjoy the world and the flesh; and still further, when it does enjoy them, and reflects that it may think and hold just what it will, that "the world is all before it where to choose," and what system to build up as its own private persuasion; when this torrent of wilful thoughts rushes over and inundates it, who will deny that the fruit of the tree of knowledge, or what the mind takes for knowledge, has made it one of the gods, with a sense of expansion and elevation,—an intoxication in reality, still, so far as the subjective state of the mind goes, an illumination? Hence the fanaticism of individuals or nations, who suddenly cast off their Maker. Their eyes are opened; and, like the judgment-stricken king in the Tragedy,[1] they see two suns, and a magic universe, out of which they look back upon their former state of faith and innocence with a sort of contempt and indignation, as if they

[1] The *Bacchæ* of Euripides. Pentheus, King of Thebes, having defied Dionysus, is smitten with madness.

were then but fools, and the dupes of imposture.

On the other hand, Religion has its own enlargement, and an enlargement, not of tumult, but of peace. It is often remarked of uneducated persons, who have hitherto thought little of the unseen world, that, on their turning to God, looking into themselves, regulating their hearts, reforming their conduct, and meditating on death and judgment, heaven and hell, they seem to become, in point of intellect, different beings from what they were. Before, they took things as they came, and thought no more of one thing than another. But now every event has a meaning; they have their own estimate of whatever happens to them; they are mindful of times and seasons, and compare the present with the past; and the world, no longer dull, monotonous, unprofitable, and hopeless, is a various and complicated drama, with parts and an object, and an awful moral.

Now from these instances, to which many more might be added, it is plain, first, that the communication of knowledge certainly is either a condition or the means of that sense of enlargement or enlightenment, of which at this day we hear so much in certain quarters: this cannot be denied; but next, it is equally plain, that such communication is not the whole of the process. The enlargement consists, not merely in the passive reception

into the mind of a number of ideas hitherto unknown to it, but in the mind's energetic and simultaneous action upon and towards and among those new ideas, which are rushing in upon it. It is the action of a formative power, reducing to order and meaning the matter of our acquirements; it is a making the objects of our knowledge subjectively our own, or, to use a familiar word, it is a digestion of what we receive, into the substance of our previous state of thought; and without this no enlargement is said to follow. There is no enlargement, unless there be a comparison of ideas one with another, as they come before the mind, and a systematizing of them. We feel our minds to be growing and expanding *then*, when we not only learn, but refer what we learn to what we know already. It is not the mere addition to our knowledge that is the illumination; but the locomotion, the movement onwards, of that mental centre, to which both what we know, and what we are learning, the accumulating mass of our acquirements, gravitates. And therefore a truly great intellect, and recognized to be such by the common opinion of mankind, such as the intellect of Aristotle, or of St. Thomas,[1] or of Newton, or of Goethe, (I purposely take instances

[1] Thomas Aquinas, the famous theologian of the thirteenth century.

within and without the Catholic pale, when I would speak of the intellect as such,) is one which takes a connected view of old and new, past and present, far and near, and which has an insight into the influence of all these one on another; without which there is no whole, and no centre. It possesses the knowledge, not only of things, but also of their mutual and true relations; knowledge, not merely considered as acquirement, but as philosophy.

Accordingly, when this analytical, distributive, harmonizing process is away, the mind experiences no enlargement, and is not reckoned as enlightened or comprehensive, whatever it may add to its knowledge. For instance, a great memory, as I have already said, does not make a philosopher, any more than a dictionary can be called a grammar. There are men who embrace in their minds a vast multitude of ideas, but with little sensibility about their real relations towards each other. These may be antiquarians, annalists, naturalists; they may be learned in the law; they may be versed in statistics; they are most useful in their own place; I should shrink from speaking disrespectfully of them; still, there is nothing in such attainments to guarantee the absence of narrowness of mind. If they are nothing more than well-read men, or men of information, they have not what specially deserves the name of culture of mind, or fulfils the type of Liberal Education.

In like manner, we sometimes fall in with persons who have seen much of the world, and of the men who, in their day, have played a conspicuous part in it, but who generalize nothing, and have no observation, in the true sense of the word. They abound in information in detail, curious and entertaining, about men and things; and, having lived under the influence of no very clear or settled principles, religious or political, they speak of every one and every thing, only as so many phenomena, which are complete in themselves, and lead to nothing, not discussing them, or teaching any truth, or instructing the hearer, but simply talking. No one would say that these persons, well informed as they are, had attained to any great culture of intellect or to philosophy.

The case is the same still more strikingly where the persons in question are beyond dispute men of inferior powers and deficient education. Perhaps they have been much in foreign countries, and they receive, in a passive, otiose, unfruitful way, the various facts which are forced upon them there. Seafaring men, for example, range from one end of the earth to the other; but the multiplicity of external objects, which they have encountered, forms no symmetrical and consistent picture upon their imagination; they see the tapestry of human life, as it were on the wrong side, and it tells no story. They sleep, and they rise up, and they find

themselves, now in Europe, now in Asia; they see visions of great cities and wild regions; they are in the marts of commerce, or amid the islands of the South; they gaze on Pompey's Pillar,[1] or on the Andes; and nothing which meets them carries them forward or backward, to any idea beyond itself. Nothing has a drift or relation; nothing has a history or a promise. Every thing stands by itself, and comes and goes in its turn, like the shifting scenes of a show, which leave the spectator where he was. Perhaps you are near such a man on a particular occasion, and expect him to be shocked or perplexed at something which occurs; but one thing is much the same to him as another, or, if he is perplexed, it is as not knowing what to say, whether it is right to admire, or to ridicule, or to disapprove, while conscious that some expression of opinion is expected from him; for in fact he has no standard of judgment at all, and no landmarks to guide him to a conclusion. Such is mere acquisition, and, I repeat, no one would dream of calling it philosophy.

Instances, such as these, confirm, by the contrast, the conclusion I have already drawn from those which preceded them. That only is true enlargement of mind which is the power of viewing many things at once as one whole, of referring

[1] A Corinthian column near Alexandria.

them severally to their true place in the universal system, of understanding their respective values, and determining their mutual dependence. Thus is that form of Universal Knowledge, of which I have on a former occasion spoken, set up in the individual intellect, and constitutes its perfection. Possessed of this real illumination, the mind never views any part of the extended subject-matter of Knowledge without recollecting that it is but a part, or without the associations which spring from this recollection. It makes every thing in some sort lead to every thing else; it would communicate the image of the whole to every separate portion, till that whole becomes in imagination like a spirit, every where pervading and penetrating its component parts, and giving them one definite meaning. Just as our bodily organs, when mentioned, recall their function in the body, as the word " creation " suggests the Creator, and " subjects " a sovereign, so, in the mind of the Philosopher, as we are abstractly conceiving of him, the elements of the physical and moral world, sciences, arts, pursuits, ranks, offices, events, opinions, individualities, are all viewed as one, with correlative functions, and as gradually by successive combinations converging, one and all, to the true centre.

To have even a portion of this illuminative reason and true philosophy is the highest state to

which nature can aspire, in the way of intellect; it puts the mind above the influences of chance and necessity, above anxiety, suspense, unsettlement, and superstition, which is the lot of the many. Men, whose minds are possessed with some one object, take exaggerated views of its importance, are feverish in the pursuit of it, make it the measure of things which are utterly foreign to it, and are startled and despond if it happens to fail them. They are ever in alarm or in transport. Those on the other hand who have no object or principle whatever to hold by, lose their way, every step they take. They are thrown out, and do not know what to think or say, at every fresh juncture; they have no view of persons, or occurrences, or facts, which come suddenly upon them, and they hang upon the opinion of others, for want of internal resources. But the intellect, which has been disciplined to the perfection of its powers, which knows, and thinks while it knows, which has learned to leaven the dense mass of facts and events with the elastic force of reason, such an intellect cannot be partial, cannot be exclusive, cannot be impetuous, cannot be at a loss, cannot but be patient, collected, and majestically calm, because it discerns the end in every beginning, the origin in every end, the law in every interruption, the limit in each delay; because it ever knows where it stands, and how its path lies from one point to

another. It is the τετραγωνος[1] of the Peripatetic, and as the "nil admirari"[2] of the Stoic,—

> Felix qui potuit rerum cognoscere causas,
> Atque metus omnes, et inexorabile fatum
> Subjecit pedibus, strepitumque Acherontis avari.[3]

There are men who, when in difficulties, originate at the moment vast ideas or dazzling projects; who, under the influence of excitement, are able to cast a light, almost as if from inspiration, on a subject or course of action which comes before them; who have a sudden presence of mind equal to any emergency, rising with the occasion, and an undaunted magnanimous bearing, and an energy and keenness which is but made intense by opposition. This is genius, this is heroism; it is the exhibition of a natural gift, which no culture can teach, at which no Institution can aim; here, on the contrary, we are concerned, not with mere nature, but with training and teaching. That perfection of the Intellect, which is the result of Education, and its *beau ideal*, to be imparted to individuals in their respective measures, is the clear, calm, accurate vision and comprehension of all things, as far as the finite mind can embrace

[1] Four-square.

[2] To be moved by nothing.

[3] Happy is he who has come to know the sequences of things, and is thus above all fear, and the dread march of fate, and the roar of greedy Acheron.

them, each in its place, and with its own characteristics upon it. It is almost prophetic from its knowledge of history; it is almost heart-searching from its knowledge of human nature; it has almost supernatural charity from its freedom from littleness and prejudice; it has almost the repose of faith, because nothing can startle it; it has almost the beauty and harmony of heavenly contemplation, so intimate is it with the eternal order of things and the music of the spheres.

And now, if I may take for granted that the true and adequate end of intellectual training and of a University is not Learning or Acquirement, but rather, is Thought or Reason exercised upon Knowledge, or what may be called Philosophy, I shall be in a position to explain the various mistakes which at the present day beset the subject of University Education.

I say then, if we would improve the intellect, first of all, we must ascend; we cannot gain real knowledge on a level; we must generalize, we must reduce to method, we must have a grasp of principles, and group and shape our acquisitions by means of them. It matters not whether our field of operation be wide or limited; in every case, to command it, is to mount above it. Who has not felt the irritation of mind and impatience created by a deep, rich country, visited for the first time, with winding lanes, and high hedges, and green

steeps, and tangled woods, and every thing smiling indeed, but in a maze? The same feeling comes upon us in a strange city, when we have no map of its streets. Hence you hear of practised travelers, when they first come into a place, mounting some high hill or church tower, by way of reconnoitring its neighborhood. In like manner, you must be above your knowledge, not under it, or it will oppress you; and the more you have of it, the greater will be the load. The learning of a Salmasius or a Burman,[1] unless you are its master, will be your tyrant. "Imperat aut servit;"[2] if you can wield it with a strong arm, it is a great weapon; otherwise,

> Vis consili expers
> Mole ruit sua.[3]

You will be overwhelmed, like Tarpeia, by the heavy wealth which you have exacted from tributary generations.

Instances abound; there are authors who are as pointless as they are inexhaustible in their literary resources. They measure knowledge by bulk, as it lies in the rude block, without symmetry, without design. How many commentators are there

[1] Salmasius (1588–1653), Dutch scholar; Burman (1668–1741), Dutch theologian.

[2] It rules or it serves.

[3] Brute force without intelligence falls of its own weight.

on the Classics, how many on Holy Scripture, from whom we rise up, wondering at the learning which has passed before us, and wondering why it passed! How many writers are there of Ecclesiastical History, such as Mosheim or Du Pin, who, breaking up their subject into details, destroy its life, and defraud us of the whole by their anxiety about the parts! The Sermons, again, of the English Divines in the seventeenth century, how often are they mere repertories of miscellaneous and officious learning! Of course Catholics also may read without thinking; and in their case, equally as with Protestants, it holds good, that such knowledge is unworthy of the name, knowledge which they have not thought through, and thought out. Such readers are only possessed by their knowledge, not possessed of it; nay, in matter of fact they are often even carried away by it, without any volition of their own. Recollect, the Memory can tyrannize, as well as the Imagination. Derangement, I believe, has been considered as a loss of control over the sequence of ideas. The mind, once set in motion, is henceforth deprived of the power of initiation, and becomes the victim of a train of associations, one thought suggesting another, in the way of cause and effect, as if by a mechanical process, or some physical necessity. No one, who has had experience of men of studious habits, but must recognize the existence of a

parallel phenomenon in the case of those who have over-stimulated the Memory. In such persons Reason acts almost as feebly and as impotently as in the madman; once fairly started on any subject whatever, they have no power of self-control; they passively endure the succession of impulses which are evolved out of the original exciting cause; they are passed on from one idea to another and go steadily forward, plodding along one line of thought in spite of the amplest concessions of the hearer, or wandering from it in endless digression in spite of his remonstrances. Now, if, as is very certain, no one would envy the madman the glow and originality of his conceptions, why must we extol the cultivation of that intellect, which is the prey, not indeed of barren fancies but of barren facts, of random intrusions from without, though not of morbid imaginations from within? And in thus speaking, I am not denying that a strong and ready memory is in itself a real treasure; I am not disparaging a well-stored mind, though it be nothing besides, provided it be sober, any more than I would despise a bookseller's shop:—it is of great value to others, even when not so to the owner. Nor am I banishing, far from it, the possessors of deep and multifarious learning from my ideal University; they adorn it in the eyes of men; I do but say that they constitute no type of the results at which it aims;

that it is no great gain to the intellect to have enlarged the memory at the expense of faculties which are indisputably higher.

Nor indeed am I supposing that there is any great danger, at least in this day, of over-education; the danger is on the other side. I will tell you, Gentlemen, what has been the practical error of the last twenty years,—not to load the memory of the student with a mass of undigested knowledge, but to force upon him so much that he has rejected all. It has been the error of distracting and enfeebling the mind by an unmeaning profusion of subjects; of implying that a smattering in a dozen branches of study is not shallowness, which it really is, but enlargement, which it is not; of considering an acquaintance with the learned names of things and persons, and the possession of clever duodecimos, and attendance on eloquent lecturers, and membership with scientific institutions, and the sight of the experiments of a platform and the specimens of a museum, that all this was not dissipation of mind, but progress. All things now are to be learned at once, not first one thing, then another, not one well, but many badly. Learning is to be without exertion, without attention, without toil; without grounding, without advance, without finishing. There is to be nothing individual in it; and this, forsooth, is the wonder of the age. What the steam engine does

with matter, the printing press is to do with mind; it is to act mechanically, and the population is to be passively, almost unconsciously enlightened, by the mere multiplication and dissemination of volumes. Whether it be the school boy, or the school girl, or the youth at college, or the mechanic in the town, or the politician in the senate, all have been the victims in one way or other of this most preposterous and pernicious of delusions. Wise men have lifted up their voices in vain; and at length, lest their own institutions should be outshone and should disappear in the folly of the hour, they have been obliged, as far as they could with a good conscience, to humor a spirit which they could not withstand, and make temporizing concessions at which they could not but inwardly smile.

It must not be supposed that, because I so speak, therefore I have some sort of fear of the education of the people: on the contrary, the more education they have, the better, so that it is really education. Nor am I an enemy to the cheap publication of scientific and literary works, which is now in vogue: on the contrary, I consider it a great advantage, convenience, and gain; that is, to those to whom education has given a capacity for using them. Further, I consider such innocent recreations as science and literature are able to furnish will be a very fit occupation of the

thoughts and the leisure of young persons, and may be made the means of keeping them from bad employments and bad companions. Moreover, as to that superficial acquaintance with chemistry, and geology, and astronomy, and political economy, and modern history, and biography, and other branches of knowledge, which periodical literature and occasional lectures and scientific institutions diffuse through the community, I think it a graceful accomplishment, and a suitable, nay, in this day a necessary accomplishment, in the case of educated men. Nor, lastly, am I disparaging or discouraging the thorough acquisition of any one of these studies, or denying that, as far as it goes, such thorough acquisition is a real education of the mind. All I say is, call things by their right names, and do not confuse together ideas which are essentially different. A thorough knowledge of one science and a superficial acquaintance with many, are not the same thing; a smattering of a hundred things or a memory for detail, is not a philosophical or comprehensive view. Recreations are not education; accomplishments are not education. Do not say, the people must be educated, when, after all, you only mean, amused, refreshed, soothed, put into good spirits and good humor, or kept from vicious excesses. I do not say that such amusements, such occupations of mind, are not a great gain; but

they are not education. You may as well call drawing and fencing education, as a general knowledge of botany or conchology. Stuffing birds or playing string instruments is an elegant pastime, and a resource to the idle, but it is not education; it does not form or cultivate the intellect. Education is a high word; it is the preparation for knowledge, and it is the imparting of knowledge in proportion to that preparation. We require intellectual eyes to know withal, as bodily eyes for sight. We need both objects and organs intellectual; we cannot gain them without setting about it; we cannot gain them in our sleep, or by haphazard. The best telescope does not dispense with eyes; the printing press or the lecture room will assist us greatly, but we must be true to ourselves, we must be parties in the work. A University is, according to the usual designation, an Alma Mater, knowing her children one by one, not a foundry, or a mint, or a treadmill.

I protest to you, Gentlemen, that if I had to choose between a so-called University, which dispensed with residence and tutorial superintendence, and gave its degrees to any person who passed an examination in a wide range of subjects, and a University which had no professors or examinations at all, but merely brought a number of young men together for three or four years, and then sent them away as the University of

Oxford is said to have done some sixty years since, if I were asked which of these two methods was the better discipline of the intellect,—mind, I do not say which is *morally* the better, for it is plain that compulsory study must be a good and idleness an intolerable mischief,—but if I must determine which of the two courses was the more successful in training, moulding, enlarging the mind, which sent out men the more fitted for their secular duties, which produced better public men, men of the world, men whose names would descend to posterity, I have no hesitation in giving the preference to that University which did nothing, over that which exacted of its members an acquaintance with every science under the sun. And, paradox as this may seem, still if results be the test of systems, the influence of the public schools and colleges of England, in the course of the last century, at least will bear out one side of the contrast as I have drawn it. What would come, on the other hand, of the ideal systems of education which have fascinated the imagination of this age, could they ever take effect, and whether they would not produce a generation frivolous, narrow-minded and resourceless, intellectually considered, is a fair subject for debate; but so far is certain, that the Universities and scholastic establishments, to which I refer, and which did little more than bring together first boys and then youths in large

numbers, these institutions, with miserable deformities on the side of morals, with a hollow profession of Christianity, and a heathen code of ethics,—I say, at least they can boast of a succession of heroes and statesmen, of literary men and philosophers, of men conspicuous for great natural virtues, for habits of business, for knowledge of life, for practical judgment, for cultivated tastes, for accomplishments, who have made England what it is,—able to subdue the earth, able to domineer over Catholics.

How is this to be explained? I suppose as follows: When a multitude of young men, keen, openhearted, sympathetic, and observant, as young men are, come together and freely mix with each other, they are sure to learn one from another, even if there be no one to teach them; the conversation of all is a series of lectures to each, and they gain for themselves new ideas and views, fresh matter of thought, and distinct principles for judging and acting, day by day. An infant has to learn the meaning of the information which its senses convey to it, and this seems to be its employment. It fancies all that the eye presents to it to be close to it, till it actually learns the contrary, and thus by practice does it ascertain the relations and uses of those first elements of knowledge which are necessary for its animal existence. A parallel teaching is necessary for our social

being, and it is secured by a large school or a college; and this effect may be fairly called in its own department an enlargement of mind. It is seeing the world on a small field with little trouble; for the pupils or students come from very different places, and with widely different notions, and there is much to generalize, much to adjust, much to eliminate, there are inter-relations to be defined, and conventional rules to be established, in the process, by which the whole assemblage is moulded together, and gains one tone and one character.

Let it be clearly understood, I repeat it, that I am not taking into account moral or religious considerations; I am but saying that that youthful community will constitute a whole, it will embody a specific idea, it will represent a doctrine, it will administer a code of conduct, and it will furnish principles of thought and action. It will give birth to a living teaching, which in course of time will take the shape of a self-perpetuating tradition, or a *genius loci*, as it is sometimes called; which haunts the home where it has been born, and which imbues and forms, more or less, and one by one, every individual who is successively brought under its shadow. Thus it is that, independent of direct instruction on the part of Superiors, there is a sort of self-education in the academic institutions of Protestant England; a characteristic tone of thought, a recognized stand-

ard of judgment is found in them, which, as developed in the individual who is submitted to it, becomes a twofold source of strength to him, both from the distinct stamp it impresses on his mind, and from the bond of union which it creates between him and others,—effects which are shared by the authorities of the place, for they themselves have been educated in it, and at all times are exposed to the influence of its ethical atmosphere. Here then is a real teaching, whatever be its standards and principles, true, or false; and it at least tends towards cultivation of the intellect, it at least recognizes that knowledge is something more than a sort of passive reception of scraps and details; it is a something, and it does a something, which never will issue from the most strenuous efforts of a set of teachers, with no mutual sympathies and no inter-communion, of a set of examiners with no opinions which they dare profess, and with no common principles, who are teaching or questioning a set of youths who do not know them, and do not know each other, on a large number of subjects, different in kind, and connected by no wide philosophy, three times a week, or three times a year, or once in three years, in chill lecture-rooms or on a pompous anniversary.

Nay, self-education in any shape, in the most restricted sense, is preferable to a system of teaching which, professing so much, really does so little

for the mind. Shut your College gates against the votary of knowledge, throw him back upon the searchings and the efforts of his own mind; he will gain by being spared an entrance into your Babel. Few indeed there are who can dispense with the stimulus and support of instructors, or will do any thing at all, if left to themselves. And fewer still (though such great minds are to be found), who will not, from such unassisted attempts, contract a self-reliance and a self-esteem, which are not only moral evils, but serious hindrances to the attainment of truth. And next to none, perhaps, or none, who will not be reminded from time to time of the disadvantage under which they lie, by their imperfect grounding, by the breaks, deficiencies, and irregularities of their knowledge, by the eccentricity of opinion and the confusion of principle which they exhibit. They will be too often ignorant of what every one knows and takes for granted, of that multitude of small truths which fall upon the mind like dust, impalpable and ever accumulating; they may be unable to converse, they may argue perversely, they may pride themselves on their worst paradoxes or their grossest truisms, they may be full of their own mode of viewing things, unwilling to be put out of their way, slow to enter into the minds of others;—but, with these and whatever other liabilities upon their heads, they are likely to have

more thought, more mind, more philosophy, more true enlargement, than those earnest but ill-used persons, who are forced to load their minds with a score of subjects against an examination, who have too much on their hands to indulge themselves in thinking or investigation, who devour premiss and conclusion together with indiscriminate greediness, who hold whole sciences on faith, and commit demonstrations to memory, and who too often, as might be expected, when their period of education is passed, throw up all they have learned in disgust, having gained nothing really by their anxious labors, except perhaps the habit of application.

Yet such is the better specimen of the fruit of that ambitious system which has of late years been making way among us: for its result on ordinary minds, and on the common run of students, is less satisfactory still; they leave their place of education simply dissipated and relaxed by the multiplicity of subjects, which they have never really mastered, and so shallow as not even to know their shallowness. How much better, I say, is it for the active and thoughtful intellect, where such is to be found, to eschew the College and the University altogether, than to submit to a drudgery so ignoble, a mockery so contumelious! How much more profitable for the independent mind, after the mere rudiments of educa-

tion, to range through a library at random, taking down books as they meet him, and pursuing the trains of thought which his mother wit suggests! How much healthier to wander into the fields, and there with the exiled Prince [1] to find "tongues in the trees, books in the running brooks!" How much more genuine an education is that of the poor boy in the Poem [2]—a Poem, whether in conception or in execution, one of the most touching in our language—who, not in the wide world, but ranging day by day around his widowed mother's home, "a dexterous gleaner" in a narrow field, and with only such slender outfit

> as the village school and books a few
> Supplied,

contrived from the beach, and the quay, and the fisher's boat, and the inn's fireside, and the tradesman's shop, and the shepherd's walk, and the smuggler's hut, and the mossy moor, and the

[1] Duke Ferdinand in *As You Like It*.

[2] Crabbe's Tales of the Hall. This Poem, let me say, I read on its first publication, above thirty years ago, with extreme delight, and have never lost my love of it; and on taking it up lately, found I was even more touched by it than heretofore. A work which can please in youth and age, seems to fulfil (in logical language) the *accidental definition* of a Classic. (A further course of twenty years has past, and I bear the same witness in favor of this Poem.) [Author's note.]

screaming gulls, and the restless waves, to fashion for himself a philosophy and a poetry of his own!

But in a large subject, I am exceeding my necessary limits. Gentlemen, I must conclude abruptly; and postpone any summing up of my argument, should that be necessary, to another day.

KNOWLEDGE VIEWED IN RELATION TO PROFESSIONAL SKILL[1]

JOHN HENRY NEWMAN

I HAVE been insisting, in my two preceding Discourses, first, on the cultivation of the intellect, as an end which may reasonably be pursued for its own sake; and next, on the nature of that cultivation, or what that cultivation consists in. Truth of whatever kind is the proper object of the intellect; its cultivation then lies in fitting it to apprehend and contemplate truth. Now the intellect in its present state, with exceptions which need not here be specified, does not discern truth intuitively, or as a whole. We know, not by a direct and simple vision, not at a glance, but, as it were, by piecemeal and accumulation, by a mental process, by going round an object, by the comparison, the combination, the mutual correction, the continual adaptation, of many partial notions, by the employment, concentration, and joint

[1] The seventh of a series of nine *Discourses on University Teaching* delivered to the Catholics of Dublin in 1852.

action of many faculties and exercises of mind. Such a union and concert of the intellectual powers, such an enlargement and development, such a comprehensiveness, is necessarily a matter of training. And again, such a training is a matter of rule; it is not mere application, however exemplary, which introduces the mind to truth, nor the reading many books, nor the getting up many subjects, nor the witnessing many experiments, nor the attending many lectures. All this is short of enough; a man may have done it all, yet be lingering in the vestibule of knowledge:—he may not realize what his mouth utters; he may not see with his mental eye what confronts him; he may have no grasp of things as they are; or at least he may have no power at all of advancing one step forward of himself, in consequence of what he has already acquired, no power of discriminating between truth and falsehood, of sifting out the grains of truth from the mass, of arranging things according to their real value, and, if I may use the phrase, of building up ideas. Such a power is the result of a scientific formation of mind; it is an acquired faculty of judgment, of clear-sightedness, of sagacity, of wisdom, of philosophical reach of mind, and of intellectual self-possession and repose,—qualities which do not come of mere acquirement. The bodily eye, the organ for apprehending material objects, is pro-

vided by nature; the eye of the mind, of which the object is truth, is the work of discipline and habit.

This process of training, by which the intellect, instead of being formed or sacrificed to some particular or accidental purpose, some specific trade or profession, or study or science, is disciplined for its own sake, for the perception of its own proper object, and for its own highest culture, is called Liberal Education; and though there is no one in whom it is carried as far as is conceivable, or whose intellect would be a pattern of what intellects should be made, yet there is scarcely any one but may gain an idea of what real training is, and at least look towards it, and make its true scope and result, not something else, his standard of excellence; and numbers there are who may submit themselves to it, and secure it to themselves in good measure. And to set forth the right standard, and to train according to it, and to help forward all students towards it according to their various capacities, this I conceive to be the business of a University.

Now this is what some great men are very slow to allow; they insist that Education should be confined to some particular and narrow end, and should issue in some definite work, which can be weighed and measured. They argue as if every thing, as well as every person, had its price; and that where there has been a great outlay they have

a right to expect a return in kind. This they call making Education and Instruction "useful," and "Utility" becomes their watchword. With a fundamental principle of this nature, they very naturally go on to ask, what there is to show for the expense of a University; what is the real worth in the market of the article called "a Liberal Education," on the supposition that it does not teach us definitely how to advance our manufactures, or to improve our lands, or to better our civil economy; or again, if it does not at once make this man a lawyer, that an engineer, and that a surgeon; or at least if it does not lead to discoveries in chemistry, astronomy, geology, magnetism, and science of every kind.

This question, as might have been expected, has been keenly debated in the present age, and formed one main subject of the controversy, to which I referred in the Introduction to the present Discourses, as having been sustained in the first decade of this century by a celebrated Northern Review [1] on the one hand, and defenders of the University of Oxford on the other. Hardly had the authorities of that ancient seat of learning, waking from their long neglect, set on foot a plan for the education of the youth committed to them, than the representatives of science and literature in the city, which has sometimes been called the

[1] *The Edinburgh Review.*

Northern Athens, remonstrated, with their gravest arguments and their most brilliant satire, against the direction and shape which the reform was taking. Nothing would content them, but that the University should be set to rights on the basis of the philosophy of Utility; a philosophy, as they seem to have thought, which needed but to be proclaimed in order to be embraced. In truth, they were little aware of the depth and force of the principles on which the academical authorities were proceeding, and, this being so, it was not to be expected that they would be allowed to walk at leisure over the field of controversy which they had selected. Accordingly they were encountered in behalf of the University by two men of great name and influence in their day, of very different minds, but united, as by Collegiate ties, so in the clear-sighted and large view which they took of the whole subject of Liberal Education; and the defence thus provided for the Oxford studies has kept its ground to this day.

Let me be allowed to devote a few words to the memory of distinguished persons, under the shadow of whose name I once lived, and by whose doctrine I am now profiting. In the heart of Oxford there is a small plot of ground, hemmed in by public thoroughfares, which has been the possession and the home of one Society for above five hundred years. In the old time of Boniface the

Eighth and John the Twenty-second, in the age of Scotus and Occam and Dante, before Wiclif or Huss had kindled those miserable fires which are still raging to the ruin of the highest interest of man, an unfortunate King of England, Edward the Second, flying from the field of Bannockburn, is said to have made a vow to the Blessed Virgin to found a religious house in her honor, if he got back in safety. Prompted and aided by his Almoner, he decided on placing this house in the city of Alfred; and the Image of our Lady, which is opposite its entrance-gate, is to this day the token of the vow and its fulfilment. King and Almoner have long been in the dust, and strangers have entered into their inheritance, and their creed has been forgotten, and their holy rites disowned; but day by day a memento is still made in the holy Sacrifice by at least one Catholic Priest, once a member of that College, for the souls of those Catholic benefactors who fed him there for so many years. The visitor, whose curiosity has been excited by its present fame, gazes perhaps with something of disappointment on a collection of buildings which have with them so few of the circumstances of dignity or wealth. Broad quadrangles, high halls and chambers, ornamented cloisters, stately walks, or umbrageous gardens, a throng of students, ample revenues, or a glorious history, none of these things were the portion

of that old Catholic foundation; nothing in short which to the common eye sixty years ago would have given tokens of what it was to be. But it had at that time a spirit working within it, which enabled its inmates to do, amid its seeming insignificance, what no other body in the place could equal; not a very abstruse gift or extraordinary boast, but a rare one, the honest purpose to administer the trust committed to them in such a way as their conscience pointed out as best. So, whereas the Colleges of Oxford are self-electing bodies, the fellows in each perpetually filling up for themselves the vacancies which occur in their number, the members of this foundation determined, at a time when, either from evil custom or from ancient statute, such a thing was not known elsewhere, to throw open their fellowships to the competition of all comers, and, in the choice of associates henceforth, to cast to the winds every personal motive and feeling, family connection, and friendship, and patronage, and political interest, and local claim, and prejudice, and party jealousy, and to elect solely on public and patriotic grounds. Nay, with a remarkable independence of mind, they resolved that even the table of honors, awarded to literary merit by the University in its new system of examination for degrees, should not fetter their judgment as electors; but that at all risks, and whatever criti-

cism it might cause, and whatever odium they might incur, they would select the men, whoever they were, to be children of their Founder, whom they thought in their consciences to be most likely from their intellectual and moral qualities to please him, if (as they expressed it) he were still upon earth, most likely to do honor to his College, most likely to promote the objects which they believed he had at heart. Such persons did not promise to be the disciples of a low Utilitarianism; and consequently, as their collegiate reform synchronized with that reform of the Academic body, in which they bore a principal part, it was not unnatural that, when the storm broke upon the University from the North, their Alma Mater, whom they loved, should have found her first defenders within the walls of that small College, which had first put itself into a condition to be her champion.

These defenders, I have said, were two, of whom the most distinguished was the late Dr. Copleston, then a Fellow of the College, successively its Provost, and Protestant Bishop of Llandaff. In that Society, which owes so much to him, his name lives, and ever will live, for the distinction which his talents bestowed on it, for the academical importance to which he raised it, for the generosity of spirit, the liberality of sentiment, and the kindness of heart, with which he adorned it, and which

even those who had least sympathy with some aspects of his mind and character could not but admire and love. Men come to their meridian at various periods of their lives; the last years of the eminent person I am speaking of were given to duties which, I am told, have been the means of endearing him to numbers, but which afforded no scope for that peculiar vigor and keenness of mind which enabled him, when a young man, single-handed, with easy gallantry, to encounter and overthrow the charge of three giants of the North combined against him. I believe I am right in saying that, in the progress of the controversy, the most scientific, the most critical, and the most witty, of that literary company, all of them now, as he himself, removed from this visible scene, Professor Playfair, Lord Jeffrey, and the Rev. Sydney Smith, threw together their several efforts into one article of their Review, in order to crush and pound to dust the audacious controvertist who had come out against them in defence of his own Institutions. To have even contended with such men was a sufficient voucher for his ability, even before we open his pamphlets, and have actual evidence of the good sense, the spirit, the scholar-like taste, and the purity of style, by which they are distinguished.

He was supported in the controversy, on the same general principles, but with more of method

and distinctness, and, I will add, with greater force and beauty and perfection, both of thought and of language, by the other distinguished writer, to whom I have already referred, Mr. Davison; who, though not so well known to the world in his day, has left more behind him than the Provost of Oriel, to make his name remembered by posterity. This thoughtful man, who was the admired and intimate friend of a very remarkable person, whom, whether he wish it or not, numbers revere and love as the first author of the subsequent movement in the Protestant Church towards Catholicism,[1] this grave and philosophical writer, whose works I can never look into without sighing that such a man was lost to the Catholic Church, as Dr. Butler before him, by some early bias or some fault of self-education—he, in a review of a work by Mr. Edgeworth on Professional Education, which attracted a good deal of attention in its day, goes leisurely over the same ground, which had already been rapidly traversed by Dr. Copleston, and, though professedly employed upon Mr. Edgeworth, is really replying to the northern critic who had brought that writer's work into notice, and to a far greater

[1] Mr. Keble, Vicar of Hursley, late Fellow of Oriel, and Professor of Poetry in the University of Oxford. [Author's note.]

author than either of them, who in a past age had argued on the same side.

The author to whom I allude is no other than Locke. That celebrated philosopher has preceded the Edinburgh Reviewers in condemning the ordinary subjects in which boys are instructed at school, on the ground that they are not needed by them in after life; and before quoting what his disciples have said in the present century, I will refer to a few passages of the master. "'Tis matter of astonishment," he says in his work on Education, "that men of quality and parts should suffer themselves to be so far misled by custom and implicit faith. Reason, if consulted with, would advise, that their children's time should be spent in acquiring what might be *useful* to them, when they come to be men, rather than that their heads should be stuffed with a deal of trash, a great part whereof they usually never do ('tis certain they never need to) think on again as long as they live; and so much of it as does stick by them they are only the worse for."

And so again, speaking of verse-making, he says, "I know not what reason a father can have to wish his son a poet, who does not desire him to *bid defiance to all other callings and business;* which is not yet the worst of the case; for, if he proves a successful rhymer and gets once the reputation of a wit, I desire it to be considered, what

company and places he is likely to spend his time in, nay, and estate too; for it is very seldom seen that any one discovers *mines of gold or silver in Parnassus.* 'Tis a pleasant air, but a barren soil."

In another passage he distinctly limits utility in education to its bearing on the future profession or trade of the pupil, that is, he scorns the idea of any education of the intellect, simply as such. "Can there be any thing more ridiculous," he asks, "than that a father should waste his own money, and his son's time, in setting him to *learn the Roman language* when at the same time he *designs him for a trade,* wherein he, having no use of Latin, fails not to forget that little which he brought from school, and which 'tis ten to one he abhors for the ill-usage it procured him? Could it be believed, unless we have every where amongst us examples of it, that a child should be forced to learn the rudiments of a language, which *he is never to use in the course of life that he is designed to,* and neglect all the while the writing a good hand, and casting accounts, which are of great advantage in all conditions of life, and to most trades indispensably necessary?" Nothing of course can be more absurd than to neglect in education those matters which are necessary for a boy's future calling; but the tone of Locke's remarks evidently implies more than this,

and is condemnatory of any teaching which tends to the general cultivation of the mind.

Now to turn to his modern disciples. The study of the Classics had been made the basis of the Oxford education, in the reforms which I have spoken of, and the Edinburgh Reviewers protested, after the manner of Locke, that no good could come of a system which was not based upon the principle of Utility.

" Classical Literature," they said, " is the great object at Oxford. Many minds, so employed, have produced many works and much fame in that department; but if all liberal arts and sciences, *useful to human life*, had been taught there, if *some* had dedicated themselves to *chemistry*, *some* to *mathematics*, *some* to *experimental philosophy*, and if *every* attainment had been honored in the mixed ratio of its difficulty and *utility*, the system of such a University would have been much more valuable, but the splendor of its name some thing less."

Utility may be made the end of education, in two respects: either as regards the individual educated, or the community at large. In which light do these writers regard it? in the latter. So far they differ from Locke, for they consider the advancement of science as the supreme and real end of a University. This is brought into view in the sentences which follow.

"When a University has been doing *useless* things for a long time, it appears at first degrading to them to be *useful*. A set of Lectures on Political Economy would be discouraged in Oxford, probably despised, probably not permitted. To discuss the enclosure of commons, and to dwell upon imports and exports, to come so near to common life, would seem to be undignified and contemptible. In the same manner, the Parr or the Bentley [1] of the day would be scandalized, in a University, to be put on a level with the discoverer of a neutral salt; and yet, *what other measure is there of dignity in intellectual labor but usefulness?* And what ought the term University to mean, but a place where every science is taught which is liberal, and at the same time useful to mankind? Nothing would so much tend to bring classical literature within proper bounds as *a steady and invariable appeal to utility* in our appreciation of all human knowledge. . . . *Looking always to real utility as our guide*, we should see, with equal pleasure, a studious and inquisitive mind arranging the productions of nature, investigating the qualities of bodies, or mastering the difficulties of the learned languages. We should not care whether he was chemist, natural-

[1] Samuel Parr (1747–1825), a prominent English scholar; Richard Bentley (1662–1742), the distinguished English Classical scholar.

ist, or scholar, because we know it to be as *necessary* that matter should be studied and subdued *to the use of man*, as that taste should be gratified, and imagination inflamed."

Such then is the enunciation, as far as words go, of the theory of Utility in Education; and both on its own account, and for the sake of the able men who have advocated it, it has a claim on the attention of those whose principles I am here representing. Certainly it is specious to contend that nothing is worth pursuing but what is useful; and that life is not long enough to expend upon interesting, or curious, or brilliant trifles. Nay, in one sense, I will grant it is more than specious, it is true; but, if so, how do I propose directly to meet the objection? Why, Gentlemen, I have really met it already, viz., in laying down, that intellectual culture is its own end; for what has its *end* in itself, has its *use* in itself also. I say, if a Liberal Education consists in the culture of the intellect, and if that culture be in itself a good, here, without going further, is an answer to Locke's question; for if a healthy body is a good in itself, why is not a healthy intellect? and if a College of Physicians is a useful institution, because it contemplates bodily health, why is not an Academical Body, though it were simply and solely engaged in imparting vigor and beauty and grasp to the intellectual portion of our na-

ture? And the Reviewers I am quoting seem to allow this in their better moments, in a passage which, putting aside the question of its justice in fact, is sound and true in the principles to which it appeals:—

"The present state of classical education," they say, "cultivates the *imagination* a great deal too much, and other *habits of mind* a great deal too little, and trains up many young men in a style of elegant imbecility, utterly unworthy of the talents with which nature has endowed them. . . . The matter of fact is, that a classical scholar of twenty-three or twenty-four is a man principally conversant with works of imagination. His feelings are quick, his fancy lively, and his taste good. Talents for *speculation* and *original inquiry* he has none, nor has he formed the invaluable *habit of pushing things up to their first principles*, or of collecting dry and unamusing facts as the materials for reasoning. All the solid and masculine parts of his *understanding* are left wholly without *cultivation;* he hates the pain of thinking, and suspects every man whose boldness and originality call upon him to defend his opinions and prove his assertions."

Now, I am not at present concerned with the specific question of classical education; else, I might reasonably question the justice of calling an intellectual discipline, which embraces the study

of Aristotle, Thucydides, and Tacitus, which involves Scholarship and Antiquities, *imaginative;* still so far I readily grant, that the cultivation of the "understanding," of a "talent for speculation and original inquiry," and of "the habit of pushing things up to their first principles," is a principal portion of a *good* or *liberal* education. If then the Reviewers consider such cultivation the characteristic of a *useful* education, as they seem to do in the foregoing passage, it follows, that what they mean by "useful" is just what I mean by "good" or "liberal:" and Locke's question becomes a verbal one. Whether youths are to be taught Latin or verse-making will depend on the *fact*, whether these studies tend to mental culture; but, however this is determined, so far is clear, that in that mental culture consists what I have called a liberal or non-professional, and what the Reviewers call a useful education.

This is the obvious answer which may be made to those who urge upon us the claims of Utility in our plans of Education; but I am not going to leave the subject here: I mean to take a wider view of it. Let us take "useful," as Locke takes it, in its proper and popular sense, and then we enter upon a large field of thought, to which I cannot do justice in one Discourse, though to-day's is all the space that I can give to it. I say, let us take "useful" to mean not what is simply

good, but what *tends* to good, or is the *instrument* of good; and in this sense also, Gentlemen, I will show you how a liberal education is truly and fully a useful, though it be not a professional, education. "Good" indeed means one thing, and "useful" means another; but I lay it down as a principle, which will save us a great deal of anxiety, that, though the useful is not always good, the good is always useful. Good is not only good, but reproductive of good; this is one of its attributes; nothing is excellent, beautiful, perfect, desirable for its own sake, but it overflows, and spreads the likeness of itself all around it. Good is prolific; it is not only good to the eye, but to the taste; it not only attracts us, but it communicates itself; it excites first our admiration and love, then our desire and our gratitude, and that, in proportion to its intenseness and fulness in particular instances. A great good will impart great good. If then the intellect is so excellent a portion of us, and its cultivation so excellent, it is not only beautiful, perfect, admirable, and noble in itself, but in a true and high sense it must be useful to the possessor and to all around him; not useful in any low, mechanical, mercantile sense, but as diffusing good, or as a blessing, or a gift, or power, or a treasure, first to the owner, then through him to the world. I say then, if

a liberal education be good, it must necessarily be useful too.

You will see what I mean by the parallel of bodily health. Health is a good in itself, though nothing came of it, and is especially worth seeking and cherishing; yet, after all, the blessings which attend its presence are so great, while they are so close to it and so redound back upon it and encircle it, that we never think of it except as useful as well as good, and praise and prize it for what it does, as well as for what it is, though at the same time we cannot point out any definite and distinct work or production which it can be said to effect. And so as regards intellectual culture, I am far from denying utility in this large sense as the end of Education, when I lay it down, that the culture of the intellect is a good in itself and its own end; I do not exclude from the idea of intellectual culture what it cannot but be, from the very nature of things; I only deny that we must be able to point out, before we have any right to call it useful, some art, or business, or profession, or trade, or work, as resulting from it, and as its real and complete end. The parallel is exact:—As the body may be sacrificed to some manual or other toil, whether moderate or oppressive, so may the intellect be devoted to some specific profession; and I do not call *this* the culture of the intellect. Again, as some member or

organ of the body may be inordinately used and developed, so may memory, or imagination, or the reasoning faculty; and *this* again is not intellectual culture. On the other hand, as the body may be tended, cherished, and exercised with a simple view to its general health, so may the intellect also be generally exercised in order to its perfect state; and this *is* its cultivation.

Again, as health ought to precede labor of the body, and as a man in health can do what an unhealthy man cannot do, and as of this health the properties are strength, energy, agility, graceful carriage and action, manual dexterity, and endurance of fatigue, so in like manner general culture of mind is the best aid to professional and scientific study, and educated men can do what illiterate cannot; and the man who has learned to think and to reason and to compare and to discriminate and to analyze, who has refined his taste, and formed his judgment, and sharpened his mental vision, will not indeed at once be a lawyer, or a pleader, or an orator, or a statesman, or a physician, or a good landlord, or a man of business, or a soldier, or an engineer, or a chemist, or a geologist, or an antiquarian, but he will be placed in that state of intellect in which he can take up any one of the sciences or callings I have referred to, or any other for which he has a taste or special talent, with an ease, a grace, a versatility,

and a success, to which another is a stranger. In this sense then, and as yet I have said but a very few words on a large subject, mental culture is emphatically *useful.*

If then I am arguing, and shall argue, against Professional or Scientific knowledge as the sufficient end of a University Education, let me not be supposed, Gentlemen, to be disrespectful towards particular studies, or arts, or vocations, and those who are engaged in them. In saying that Law or Medicine is not the end of a University course, I do not mean to imply that the University does not teach Law or Medicine. What indeed can it teach at all, if it does not teach something particular? It teaches *all* knowledge by teaching all *branches* of knowledge, and in no other way. I do but say that there will be this distinction as regards a Professor of Law, or of Medicine, or of Geology, or of Political Economy, in a University and out of it, that out of a University he is in danger of being absorbed and narrowed by his pursuit, and of giving Lectures which are the Lectures of nothing more than a lawyer, physician, geologist, or political economist; whereas in a University he will just know where he and his science stand, he has come to it, as it were, from a height, he has taken a survey of all knowledge, he is kept from extravagance by the very rivalry of other studies, he has gained from

them a special illumination and largeness of mind and freedom and self-possession, and he treats his own in consequence with a philosophy and a resource, which belongs not to the study itself, but to his liberal education.

This then is how I should solve the fallacy, for so I must call it, by which Locke and his disciples would frighten us from cultivating the intellect, under the notion that no education is useful which does not teach us some temporal calling, or some mechanical art, or some physical secret. I say that a cultivated intellect, because it is a good in itself, brings with it a power and a grace to every work and occupation which it undertakes, and enables us to be more useful, and to a greater number. There is a duty we owe to human society as such, to the state to which we belong, to the sphere in which we move, to the individuals towards whom we are variously related, and whom we successively encounter in life; and that philosophical or liberal education, as I have called it, which is the proper function of a University, if it refuses the foremost place to professional interests, does but postpone them to the formation of the citizen, and, while it subserves the larger interests of philanthropy, prepares also for the successful prosecution of those merely personal objects, which at first sight it seems to disparage.

And now, Gentlemen, I wish to be allowed to enforce in detail what I have been saying, by some extracts from the writings to which I have already alluded, and to which I am so greatly indebted.

"It is an undisputed maxim in Political Economy," says Dr. Copleston, "that the separation of professions and the division of labor tend to the perfection of every art, to the wealth of nations, to the general comfort and well-being of the community. This principle of division is in some instances pursued so far as to excite the wonder of people to whose notice it is for the first time pointed out. There is no saying to what extent it may not be carried; and the more the powers of each individual are concentrated in one employment, the greater skill and quickness will he naturally display in performing it. But, while he thus contributes more effectually to the accumulation of national wealth, he becomes himself more and more degraded as a rational being. In proportion as his sphere of action is narrowed his mental powers and habits become contracted; and he resembles a subordinate part of some powerful machinery, useful in its place, but insignificant and worthless out of it. If it be necessary, as it is beyond all question necessary, that society should be split into divisions and subdivisions, in order that its several duties may be well per-

formed, yet we must be careful not to yield up ourselves wholly and exclusively to the guidance of this system; we must observe what its evils are, and we should modify and restrain it, by bringing into action other principles, which may serve as a check and counterpoise to the main force.

"There can be no doubt that every art is improved by confining the professor of it to that single study. But, *although the art itself is advanced by this concentration of mind in its service, the individual who is confined to it goes back.* The advantage of the community is nearly in an inverse ratio with his own.

"Society itself requires some other contribution from each individual, besides the particular duties of his profession. And, if no such liberal intercourse be established, it is the common failing of human nature, to be engrossed with petty views and interests, to underrate the importance of all in which we are not concerned, and to carry our partial notions into cases where they are inapplicable, to act, in short, as so many unconnected units, displacing and repelling one another.

"In the cultivation of literature is found that common link, which, among the higher and middling departments of life, unites the jarring sects and subdivisions into one interest, which supplies common topics, and kindles common feelings, unmixed with those narrow prejudices with which all

professions are more or less infected. The knowledge, too, which is thus acquired, expands and enlarges the mind, excites its faculties, and calls those limbs and muscles into freer exercise which, by too constant use in one direction, not only acquire an illiberal air, but are apt also to lose somewhat of their native play and energy. And thus, without directly qualifying a man for any of the employments of life, it enriches and ennobles all. Without teaching him the peculiar business of any one office or calling, it enables him to act his part in each of them with better grace and more elevated carriage; and, if happily planned and conducted, is a main ingredient in that complete and generous education which fits a man 'to perform justly, skilfully, and magnanimously, all the offices, both private and public, of peace and war.'" [1]

The view of Liberal Education, advocated in these extracts, is expanded by Mr. Davison in the Essay to which I have already referred. He lays more stress on the "usefulness" of Liberal Education in the larger sense of the word than his predecessor in the controversy. Instead of arguing that the Utility of knowledge to the individual varies inversely with its Utility to the public, he chiefly employs himself on the suggestions contained in Dr. Copleston's last sentences. He

[1] Vid. Milton on Education. [Author's note.]

shows, first, that a Liberal Education is something far higher, even in the scale of Utility, than what is commonly called a Useful Education, and next, that it is necessary or useful for the purposes even of that Professional Education which commonly engrosses the title of Useful. The former of these two theses he recommends to us in an argument from which the following passages are selected:—

"It is to take a very contracted view of life," he says, "to think with great anxiety how persons may be educated to superior skill in their department, comparatively neglecting or excluding the more liberal and enlarged cultivation. In his (Mr. Edgeworth's) system, the value of every attainment is to be measured by its subserviency to a calling. The specific duties of that calling are exalted at the cost of those free and independent tastes and virtues which come in to sustain the common relations of society, and raise the individual in them. In short, a man is to be usurped by his profession. He is to be clothed in its garb from head to foot. His virtues, his science, and his ideas are all to be put into a gown or uniform, and the whole man to be shaped, pressed, and stiffened, in the exact mould of his technical character. Any interloping accomplishments, or a faculty which cannot be taken into public pay, if they are to be indulged in him at all, must creep

along under the cloak of his more serviceable privileged merits. Such is the state of perfection to which the spirit and general tendency of this system would lead us.

" But the professional character is not the only one which a person engaged in a profession has to support. He is not always upon duty. There are services he owes, which are neither parochial, nor forensic, nor military, nor to be described by any such epithet of civil regulation, and yet are in no wise inferior to those that bear these authoritative titles; inferior neither in their intrinsic value, nor their moral import, nor their impression upon society. As a friend, as a companion, as a citizen at large; in the connections of domestic life; in the improvement and embellishment of his leisure, he has a sphere of action, revolving, if you please, within the sphere of his profession, but not clashing with it; in which if he can show none of the advantages of an improved understanding, whatever may be his skill or proficiency in the other, he is no more than an ill-educated man.

" There is a certain faculty in which all nations of any refinement are great practitioners. It is not taught at school or college as a distinct science; though it deserves that what is taught there should be made to have some reference to it; nor is it endowed at all by the public; everybody

being obliged to exercise it for himself in person, which he does to the best of his skill. But in nothing is there a greater difference than in the manner of doing it. The advocates of professional learning will smile when we tell them that this same faculty which we would have encouraged, is simply that of speaking good sense in English, without fee or reward, in common conversation. They will smile when we lay some stress upon it; but in reality it is no such trifle as they imagine. Look into the huts of savages, and see, for there is nothing to listen to, the dismal blank of their stupid hours of silence; their professional avocations of war and hunting are over; and, having nothing to do, they have nothing to say. Turn to improved life, and you find conversation in all its forms the medium of something more than an idle pleasure; indeed, a very active agent in circulating and forming the opinions, tastes, and feelings of a whole people. It makes of itself a considerable affair. Its topics are the most promiscuous—all those which do not belong to any particular province. As for its power and influence, we may fairly say that it is of just the same consequence to a man's immediate society, how he talks, as how he acts. Now of all those who furnish their share to rational conversation, a mere adept in his own art is universally admitted to be the worst. The sterility and uninstructiveness

of such a person's social hours are quite proverbial. Or if he escape being dull, it is only by launching into ill-timed, learned loquacity. We do not desire of him lectures or speeches; and he has nothing else to give. Among benches he may be powerful; but seated on a chair he is quite another person. On the other hand, we may affirm, that one of the best companions is a man who, to the accuracy and research of a profession, has joined a free excursive acquaintance with various learning, and caught from it the spirit of general observation."

Having thus shown that a liberal education is a real benefit to the subjects of it, as members of society, in the various duties and circumstances and accidents of life, he goes on, in the next place, to show that, over and above those direct services which might fairly be expected of it, it actually subserves the discharge of those particular functions, and the pursuit of those particular advantages, which are connected with professional exertion, and to which Professional Education is directed.

"We admit," he observes, "that when a person makes a business of one pursuit, he is in the right way to eminence in it; and that divided attention will rarely give excellence in many. But our assent will go no further. For, to think that the way to prepare a person for excelling in any one pursuit

(and that is the only point in hand), is to fetter his early studies, and cramp the first development of his mind, by a reference to the exigencies of that pursuit barely, is a very different notion, and one which, we apprehend, deserves to be exploded rather than received. Possibly a few of the abstract, insulated kinds of learning might be approached in that way. The exceptions to be made are very few, and need not be recited. But for the acquisition of professional and practical ability such maxims are death to it. The main ingredients of that ability are requisite knowledge and cultivated faculties; but, of the two, the latter is by far the chief. A man of well-improved faculties has the command of another's knowledge. A man without them, has not the command of his own.

"Of the intellectual powers, the judgment is that which takes the foremost lead in life. How to form it to the two habits it ought to possess, of exactness and vigor, is the problem. It would be ignorant presumption so much as to hint at any routine of method by which these qualities may with certainty be imparted to every or any understanding. Still, however, we may safely lay it down that they are not to be got 'by a gatherer of simples,' but are the combined essence and extracts of many different things, drawn from much varied reading and discipline, first, and observa-

tion afterwards. For if there be a single intelligible point on this head, it is that a man who has been trained to think upon one subject or for one subject only, will never be a good judge even in that one: whereas the enlargement of his circle gives him increased knowledge and power in a rapidly increasing ratio. So much do ideas act, not as solitary units, but by grouping and combination; and so clearly do all the things that fall within the proper province of the same faculty of the mind, intertwine with and support each other. Judgment lives as it were by comparison and discrimination. Can it be doubted, then, whether the range and extent of that assemblage of things upon which it is practised in its first essays are of use to its power?

"To open our way a little further on this matter, we will define what we mean by the power of judgment; and then try to ascertain among what kind of studies the improvement of it may be expected at all.

"Judgment does not stand here for a certain homely, useful quality of intellect, that guards a person from committing mistakes to the injury of his fortunes or common reputation; but for that master-principle of business, literature, and talent, which gives him strength in any subject he chooses to grapple with, and enables him to *seize the strong point* in it. Whether this definition be

metaphysically correct or not, it comes home to the substance of our inquiry. It describes the power that every one desires to possess when he comes to act in a profession, or elsewhere; and corresponds with our best idea of a cultivated mind.

"Next, it will not be denied, that in order to do any good to the judgment, the mind must be employed upon such subjects as come within the cognizance of that faculty, and give some real exercise to its perceptions. Here we have a rule of selection by which the different parts of learning may be classed for our purpose. Those which belong to the province of the judgment are religion (in its evidences and interpretation), ethics, history, eloquence, poetry, theories of general speculation, the fine arts, and works of wit. Great as the variety of these large divisions of learning may appear, they are all held in union by two capital principles of connection. First, they are all quarried out of one and the same great subject of man's moral, social, and feeling nature. And secondly, they are all under the control (more or less strict) of the same power of moral reason."

"If these studies," he continues, "be such as give a direct play and exercise to the faculty of the judgment, then they are the true basis of education for the active and inventive powers, whether destined for a profession or any other

use. Miscellaneous as the assemblage may appear, of history, eloquence, poetry, ethics, etc., blended together, they will all conspire in an union of effect. They are necessary mutually to explain and interpret each other. The knowledge derived from them all will amalgamate, and the habits of a mind versed and practised in them by turns will join to produce a richer vein of thought and of more general and practical application than could be obtained of any single one, as the fusion of the metals into Corinthian brass gave the artist his most ductile and perfect material. Might we venture to imitate an author (whom indeed it is much safer to take as an authority than to attempt to copy), Lord Bacon, in some of his concise illustrations of the comparative utility of the different studies, we should say that history would give fulness, moral philosophy strength, and poetry elevation to the understanding. Such in reality is the natural force and tendency of the studies; but there are few minds susceptible enough to derive from them any sort of virtue adequate to those high expressions. We must be contented therefore to lower our panegyric to this, that a person cannot avoid receiving some infusion and tincture, at least, of those several qualities, from that course of diversified reading. One thing is unquestionable, that the elements of general reason are not to be found fully and truly expressed in

any one kind of study; and that he who would wish to know her idiom, must read it in many books.

"If different studies are useful for aiding, they are still more useful for correcting each other; for as they have their particular merits severally, so they have their defects, and the most extensive acquaintance with one can produce only an intellect either too flashy or too jejune, or infected with some other fault of confined reading. History, for example, shows things as they are, that is, the morals and interests of men disfigured and perverted by all their imperfections of passion, folly, and ambition; philosophy strips the picture too much; poetry adorns it too much; the concentrated lights of the three correct the false peculiar coloring of each, and show us the truth. The right mode of thinking upon it is to be had from them taken all together, as every one must know who has seen their united contributions of thought and feeling expressed in the masculine sentiment of our immortal statesman, Mr. Burke, whose eloquence is inferior only to his more admirable wisdom. If any mind improved like his, is to be our instructor, we must go to the fountain-head of things as he did, and study not his works but his method; by the one we may become feeble imitators, by the other arrive at some ability of our own. But, as all biography assures us, he,

and every other able thinker, has been formed, not by a parsimonious admeasurement of studies to some definite future object (which is Mr. Edgeworth's maxim), but by taking a wide and liberal compass, and thinking a great deal on many subjects with no better end in view than because the exercise was one which made them more rational and intelligent beings."

But I must bring these extracts to an end. To-day I have confined myself to saying that that training of the intellect, which is best for the individual himself, best enables him to discharge his duties to society. The Philosopher, indeed, and the man of the world differ in their very notion, but the methods, by which they are respectively formed, are pretty much the same. The Philosopher has the same command of matters of thought, which the true citizen and gentleman has of matters of business and conduct. If then a practical end must be assigned to a University course, I say it is that of training good members of society. Its art is the art of social life, and its end is fitness for the world. It neither confines its views to particular professions on the one hand, nor creates heroes or inspires genius on the other. Works indeed of genius fall under no art; heroic minds come under no rule; a University is not a birthplace of poets or of immortal authors, of founders of schools, leaders of colonies,

or conquerors of nations. It does not promise a generation of Aristotles or Newtons, of Napoleons or Washingtons, of Raphaels or Shakespeares, though such miracles of nature it has before now contained within its precincts. Nor is it content on the other hand with forming the critic or the experimentalist, the economist or the engineer, though such too it includes within its scope. But a University training is the great ordinary means to a great but ordinary end; it aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste, at supplying true principles to popular enthusiasm and fixed aims to popular aspiration, at giving enlargement and sobriety to the ideas of the age, at facilitating the exercise of political power, and refining the intercourse of private life. It is the education which gives a man a clear conscious view of his own opinions and judgments, a truth in developing them, an eloquence in expressing them, and a force in urging them. It teaches him to see things as they are, to go right to the point, to disentangle a skein of thought, to detect what is sophistical, and to discard what is irrelevant. It prepares him to fill any post with credit, and to master any subject with facility. It shows him how to accommodate himself to others, how to throw himself into their state of mind, how to bring before them his own, how to influence them,

how to come to an understanding with them, how to bear with them. He is at home in any society, he has common ground with every class; he knows when to speak and when to be silent; he is able to converse, he is able to listen; he can ask a question pertinently, and gain a lesson seasonably, when he has nothing to impart himself; he is ever ready, yet never in the way; he is a pleasant companion, and a comrade you can depend upon; he knows when to be serious and when to trifle, and he has a sure tact which enables him to trifle with gracefulness and to be serious with effect. He has the repose of a mind which lives in itself, while it lives in the world, and which has resources for its happiness at home when it cannot go abroad. He has a gift which serves him in public, and supports him in retirement, without which good fortune is but vulgar, and with which failure and disappointment have a charm. The art which tends to make a man all this, is in the object which it pursues as useful as the art of wealth or the art of health, though it is less susceptible of method, and less tangible, less certain, less complete in its result.

ON SCIENCE AND ART IN RELATION TO EDUCATION[1]

THOMAS HENRY HUXLEY

When a man is honored by such a request as that which reached me from the authorities of your institution some time ago, I think the first thing that occurs to him is that which occurred to those who were bidden to the feast in the Gospel —to begin to make an excuse; and probably all the excuses suggested on that famous occasion crop up in his mind one after the other, including his "having married a wife," as reasons for not doing what he is asked to do. But, in my own case, and on this particular occasion, there were other difficulties of a sort peculiar to the time, and more or less personal to myself; because I felt that, if I came amongst you, I should be expected, and, indeed, morally compelled, to speak upon the subject of Scientific Education. And then there arose in my mind the recollection of a fact, which probably no one here but myself remembers; namely, that some fourteen years ago I was the

[1] An address to the members of the Liverpool Institution, 1882.

guest of a citizen of yours, who bears the honored name of Rathbone, at a very charming and pleasant dinner given by the Philomathic Society; and I there and then, and in this very city, made a speech upon the topic of Scientific Education. Under these circumstances, you see, one runs two dangers—the first, of repeating one's self, although I may fairly hope that everybody has forgotten the fact I have just now mentioned, except myself; and the second, and even greater difficulty, is the danger of saying something different from what one said before, because then, however forgotten your previous speech may be, somebody finds out its existence, and there goes on that process so hateful to members of Parliament, which may be denoted by the term "Hansardization." Under these circumstances, I came to the conclusion that the best thing I could do was to take the bull by the horns, and to "Hansardize" myself,—to put before you, in the briefest possible way, the three or four propositions which I endeavored to support on the occasion of the speech to which I have referred; and then to ask myself, supposing you were asking me, whether I had anything to retract, or to modify, in them, in virtue of the increased experience, and, let us charitably hope, the increased wisdom of an added fourteen years.

Now, the points to which I directed particular

attention on that occasion were these: in the first place, that instruction in physical science supplies information of a character of especial value, both in a practical and a speculative point of view—information which cannot be obtained otherwise; and, in the second place, that, as educational discipline, it supplies, in a better form than any other study can supply, exercise in a special form of logic, and a peculiar method of testing the validity of our processes of inquiry. I said further, that, even at that time, a great and increasing attention was being paid to physical science in our schools and colleges, and that, most assuredly, such attention must go on growing and increasing, until education in these matters occupied a very much larger share of the time which is given to teaching and training, than had been the case heretofore. And I threw all the strength of argumentation of which I was possessed into the support of these propositions. But I venture to remind you, also, of some other words I used at that time, and which I ask permission to read to you. They were these:—"There are other forms of culture besides physical science, and I should be profoundly sorry to see the fact forgotten, or even to observe a tendency to starve or cripple literary or æsthetic culture for the sake of science. Such a narrow view of the nature of education has nothing to do with my firm conclusion that a complete and thor-

ough scientific culture ought to be introduced into all schools."

I say I desire, in commenting upon these various points, and judging them as fairly as I can by the light of increased experience, to particularly emphasize this last, because I am told, although I assuredly do not know it of my own knowledge—though I think if the fact were so I ought to know it, being tolerably well acquainted with that which goes on in the scientific world, and which has gone on there for the last thirty years—that there is a kind of sect, or horde, of scientific Goths and Vandals, who think it would be proper and desirable to sweep away all other forms of culture and instruction, except those in physical science, and to make them the universal and exclusive, or, at any rate, the dominant training of the human mind of the future generation. This is not my view—I do not believe that it is anybody's view,—but it is attributed to those who, like myself, advocate scientific education. I therefore dwell strongly upon the point, and I beg you to believe that the words I have just now read were by no means intended by me as a sop to the Cerberus of culture. I have not been in the habit of offering sops to any kind of Cerberus; but it was an expression of profound conviction on my own part—a conviction forced upon me not only by my mental constitution, but by the lessons of

what is now becoming a somewhat long experience of varied conditions of life.

I am not about to trouble you with my autobiography; the omens are hardly favorable, at present, for work of that kind. But I should like if I may do so without appearing, what I earnestly desire not to be, egotistical,—I should like to make it clear to you, that such notions as these, which are sometimes attributed to me, are, as I have said, inconsistent with my mental constitution, and still more inconsistent with the upshot of the teaching of my experience. For I can certainly claim for myself that sort of mental temperament which can say that nothing human comes amiss to it. I have never yet met with any branch of human knowledge which I have found unattractive —which it would not have been pleasant to me to follow, so far as I could go; and I have yet to meet with any form of art in which it has not been possible for me to take as acute a pleasure as, I believe, it is possible for men to take.

And with respect to the circumstances of life, it so happens that it has been my fate to know many lands and many climates, and to be familiar, by personal experience, with almost every form of society, from the uncivilized savage of Papua and Australia and the civilized savages of the slums and dens of the poverty-stricken parts of great cities, to those who, perhaps, are occasionally

the somewhat over-civilized members of our upper ten thousand. And I have never found, in any of these conditions of life, a deficiency of something which was attractive. Savagery has its pleasures, I assure you, as well as civilization, and I may even venture to confess—if you will not let a whisper of the matter get back to London, where I am known—I am even fain to confess, that sometimes in the din and throng of what is called "a brilliant reception" the vision crosses my mind of waking up from the soft plank which had afforded me satisfactory sleep during the hours of the night, in the bright dawn of a tropical morning, when my comrades were yet asleep, when every sound was hushed, except the little lap-lap of the ripples against the sides of the boat, and the distant twitter of the sea-bird on the reef. And when that vision crosses my mind, I am free to confess I desire to be back in the boat again. So that, if I share with those strange persons to whose asserted, but still hypothetical existence I have referred, the want of appreciation of forms of culture other than the pursuit of physical science, all I can say is, that it is in spite of my constitution, and in spite of my experience, that such should be my fate.

But now let me turn to another point, or rather to two other points, with which I propose to

occupy myself. How far does the experience of the last fourteen years justify the estimate which I ventured to put forward of the value of scientific culture, and of the share—the increasing share—which it must take in ordinary education? Happily, in respect to that matter, you need not rely upon my testimony. In the last half-dozen numbers of the *Journal of Education*, you will find a series of very interesting and remarkable papers, by gentlemen who are practically engaged in the business of education in our great public and other schools, telling us what is doing in these schools, and what is their experience of the results of scientific education there, so far as it has gone. I am not going to trouble you with an abstract of those papers, which are well worth your study in their fulness and completeness, but I have copied out one remarkable passage, because it seems to me so entirely to bear out what I have formerly ventured to say about the value of science, both as to its subject-matter and as to the discipline which the learning of science involves. It is from a paper by Mr. Worthington—one of the masters at Clifton, the reputation of which school you know well, and at the head of which is an old friend of mine, the Rev. Mr. Wilson—to whom much credit is due for being one of the first, as I can say from my own knowledge, to take up this

question and work it into practical shape. What Mr. Worthington says is this:—

> It is not easy to exaggerate the importance of the information imparted by certain branches of science; it modifies the whole criticism of life made in maturer years. The study has often, on a mass of boys, a certain influence which, I think, was hardly anticipated, and to which a good deal of value must be attached—an influence as much moral as intellectual, which is shown in the increased and increasing respect for precision of statement, and for that form of veracity which consists in the acknowledgment of difficulties. It produces a real effect to find that Nature cannot be imposed upon, and the attention given to experimental lectures, at first superficial and curious only, soon becomes minute, serious, and practical.

Ladies and gentlemen, I could not have chosen better words to express—in fact, I have, in other words, expressed the same conviction in former days—what the influence of scientific teaching, if properly carried out, must be.

But now comes the question of properly carrying it out, because, when I hear the value of school teaching in physical science disputed, my first impulse is to ask the disputer, "What have you known about it?" and he generally tells me some lamentable case of failure. Then I ask, "What are the circumstances of the case, and how was

the teaching carried out?" I remember, some few years ago, hearing of the head-master of a large school, who had expressed great dissatisfaction with the adoption of the teaching of physical science—and that after experiment. But the experiment consisted in this—in asking one of the junior masters in the school to get up science, in order to teach it; and the young gentleman went away for a year and got up science and taught it. Well, I have no doubt that the result was as disappointing as the head-master said it was, and I have no doubt that it ought to have been as disappointing, and far more disappointing too; for, if this kind of instruction is to be of any good at all, if it is not to be less than no good, if it is to take the place of that which is already of some good, then there are several points which must be attended to.

And the first of these is the proper selection of topics, the second is practical teaching, the third is practical teachers, and the fourth is sufficiency of time. If these four points are not carefully attended to by anybody who undertakes the teaching of physical science in schools, my advice to him is, to let it alone. I will not dwell at any length upon the first point, because there is a general consensus of opinion as to the nature of the topics which should be chosen. The second point—practical teaching—is one of great impor-

tance, because it requires more capital to set it agoing, demands more time, and, last, but by no means least, it requires much more personal exertion and trouble on the part of those professing to teach, than is the case with other kinds of instruction.

When I accepted the invitation to be here this evening, your secretary was good enough to send me the addresses which have been given by distinguished persons who have previously occupied this chair. I don't know whether he had a malicious desire to alarm me; but, however that may be, I read the addresses, and derived the greatest pleasure and profit from some of them, and from none more than from the one given by the great historian, Mr. Freeman, which delighted me most of all; and, if I had not been ashamed of plagiarizing, and if I had not been sure of being found out, I should have been glad to have copied very much of what Mr. Freeman said, simply putting in the word science for history. There was one notable passage,—"The difference between good and bad teaching mainly consists in this, whether the words used are really clothed with a meaning or not." And Mr. Freeman gives a remarkable example of this. He says, when a little girl was asked where Turkey was, she answered that it was in the yard with the other fowls, and that showed she had a definite idea connected with the word

Turkey, and was, so far, worthy of praise. I quite agree with that commendation; but what a curious thing it is that one should now find it necessary to urge that this is the be-all and end-all of scientific instruction—the *sine quâ non*, the absolutely necessary condition,—and yet that it was insisted upon more than two hundred years ago by one of the greatest men science ever possessed in this country, William Harvey. Harvey wrote, or at least published, only two small books, one of which is the well-known treatise on the circulation of the blood. The other, the *Exercitationes de Generatione*,[1] is less known, but not less remarkable. And not the least valuable part of it is the preface, in which there occurs this passage: "Those who, reading the words of authors, do not form sensible images of the things referred to, obtain no true ideas, but conceive false imaginations and inane phantasms." You see, William Harvey's words are just the same in substance as those of Mr. Freeman, only they happen to be rather more than two centuries older. So that what I am now saying has its application elsewhere than in science; but assuredly in science the condition of knowing, of your own knowledge, things which you talk about, is absolutely imperative.

I remember, in my youth, there were detestable

[1] [*Anatomical*] *Exercises on the Generation* [*of Animals*]—the first part of a long title.

books which ought to have been burned by the hands of the common hangman, for they contained questions and answers to be learned by heart, of this sort, "What is a horse? The horse is termed *Equus caballus;* belongs to the class Mammalia; order, Pachydermata; family, Solidungula." Was any human being wiser for learning that magic formula? Was he not more foolish, inasmuch as he was deluded into taking words for knowledge? It is that kind of teaching that one wants to get rid of, and banished out of science. Make it as little as you like, but, unless that which is taught is based on actual observation and familiarity with facts, it is better left alone.

There are a great many people who imagine that elementary teaching might be properly carried out by teachers provided with only elementary knowledge. Let me assure you that that is the profoundest mistake in the world. There is nothing so difficult to do as to write a good elementary book, and there is nobody so hard to teach properly and well as people who know nothing about a subject, and I will tell you why. If I address an audience of persons who are occupied in the same line of work as myself, I can assume that they know a vast deal, and that they can find out the blunders I make. If they don't, it is their fault and not mine; but when I appear before a body of people who know nothing about the matter, who

take for gospel whatever I say, surely it becomes needful that I consider what I say, make sure that it will bear examination, and that I do not impose upon the credulity of those who have faith in me. In the second place, it involves that difficult process of knowing what you know so well that you can talk about it as you can talk about your ordinary business. A man can always talk about his own business. He can always make it plain; but, if his knowledge is hearsay, he is afraid to go beyond what he has recollected, and put it before those that are ignorant in such a shape that they shall comprehend it. That is why, to be a good elementary teacher, to teach the elements of any subject, requires most careful consideration, if you are a master of the subject; and, if you are not a master of it, it is needful you should familiarize yourself with so much as you are called upon to teach—soak yourself in it, so to speak—until you know it as part of your daily life and daily knowledge, and then you will be able to teach anybody. That is what I mean by practical teachers, and, although the deficiency of such teachers is being remedied to a large extent, I think it is one which has long existed, and which has existed from no fault of those who undertook to teach, but because, until the last score of years, it absolutely was not possible for any one in a great many branches of science, whatever his de-

sire might be, to get instruction which would enable him to be a good teacher of elementary things. All that is being rapidly altered, and I hope it will soon become a thing of the past.

The last point I have referred to is the question of the sufficiency of time. And here comes the rub. The teaching of science needs time, as any other subject; but it needs more time proportionally than other subjects, for the amount of work obviously done, if the teaching is to be, as I have said, practical. Work done in a laboratory involves a good deal of expenditure of time without always an obvious result, because we do not see anything of that quiet process of soaking the facts into the mind, which takes place through the organs of the senses. On this ground there must be ample time given to science teaching. What that amount of time should be is a point which I need not discuss now; in fact, it is a point which cannot be settled until one has made up one's mind about various other questions.

All, then, that I have to ask for, on behalf of the scientific people, if I may venture to speak for more than myself, is that you should put scientific teaching into what statesmen call the condition of "the most favored nation"; that is to say, that it shall have as large a share of the time given to education as any other principal subject. You may say that that is a very vague

statement, because the value of the allotment of time, under those circumstances, depends upon the number of principal subjects. It is x the time, and an unknown quantity of principal subjects dividing that, and science taking shares with the rest. That shows that we cannot deal with this question fully until we have made up our minds as to what the principal subjects of education ought to be.

I know quite well that launching myself into this discussion is a very dangerous operation; that it is a very large subject, and one which is difficult to deal with, however much I may trespass upon your patience in the time allotted to me. But the discussion is so fundamental, it is so completely impossible to make up one's mind on these matters until one has settled the question, that I will even venture to make the experiment. A great lawyer-statesman and philosopher of a former age—I mean Francis Bacon—said that truth came out of error much more rapidly than it came out of confusion. There is a wonderful truth in that saying. Next to being right in this world, the best of all things is to be clearly and definitely wrong, because you will come out somewhere. If you go buzzing about between right and wrong, vibrating and fluctuating, you come out nowhere; but if you are absolutely and thoroughly and persistently wrong, you must, some of these days,

have the extreme good fortune of knocking your head against a fact, and that sets you all straight again. So I will not trouble myself as to whether I may be right or wrong in what I am about to say, but at any rate I hope to be clear and definite; and then you will be able to judge for yourselves whether, in following out the train of thought I have to introduce, you knock your heads against facts or not.

I take it that the whole object of education is, in the first place, to train the faculties of the young in such a manner as to give their possessors the best chance of being happy and useful in their generation; and, in the second place, to furnish them with the most important portions of that immense capitalized experience of the human race which we call knowledge of various kinds. I am using the term knowledge in its widest possible sense; and the question is, what subjects to select by training and discipline, in which the object I have just defined may be best attained.

I must call your attention further to this fact, that all the subjects of our thoughts—all feelings and propositions (leaving aside our sensations as the mere materials and occasions of thinking and feeling), all our mental furniture—may be classified under one of two heads—as either within the province of the intellect, something that can be put into propositions and affirmed or denied; or

as within the province of feeling, or that which, before the name was defiled, was called the æsthetic side of our nature, and which can neither be proved nor disproved, but only felt and known.

According to the classification which I have put before you, then, the subjects of all knowledge are divisible into the two groups, matters of science and matters of art; for all things with which the reasoning faculty alone is occupied, come under the province of science; and in the broadest sense, and not in the narrow and technical sense in which we are now accustomed to use the word art, all things feelable, all things which stir our emotions, come under the term of art, in the sense of the subject-matter of the æsthetic faculty. So that we are shut up to this—that the business of education is, in the first place, to provide the young with the means and the habit of observation; and, secondly, to supply the subject-matter of knowledge either in the shape of science or of art, or of both combined.

Now, it is a very remarkable fact—but it is true of most things in this world—that there is hardly anything one-sided, or of one nature; and it is not immediately obvious what of the things that interest us may be regarded as pure science, and what may be regarded as pure art. It may be that there are some peculiarly constituted persons who, before they have advanced far into the depths of

geometry, find artistic beauty about it; but, taking the generality of mankind, I think it may be said that, when they begin to learn mathematics, their whole souls are absorbed in tracing the connection between the premisses and the conclusion, and that to them geometry is pure science. So I think it may be said that mechanics and osteology are pure science. On the other hand, melody in music is pure art. You cannot reason about it; there is no proposition involved in it. So, again, in the pictorial art, an arabesque, or a "harmony in grey," touches none but the æsthetic faculty. But a great mathematician, and even many persons who are not great mathematicians, will tell you that they derive immense pleasure from geometrical reasonings. Everybody knows mathematicians speak of solutions and problems as "elegant," and they tell you that a certain mass of mystic symbols is "beautiful, quite lovely." Well, you do not see it. They do see it, because the intellectual process, the process of comprehending the reasons symbolized by these figures and these signs, confers upon them a sort of pleasure, such as an artist has in visual symmetry. Take a science of which I may speak with more confidence, and which is the most attractive of those I am concerned with. It is what we call morphology, which consists in tracing out the unity in variety of the infinitely diversified structures of animals

and plants. I cannot give you any example of a thorough æsthetic pleasure more intensely real than a pleasure of this kind—the pleasure which arises in one's mind when a whole mass of different structures run into one harmony as the expression of a central law. That is where the province of art overlays and embraces the province of intellect. And, if I may venture to express an opinion on such a subject, the great majority of forms of art are not in the sense in which I just now defined them, pure art; but they derive much of their quality from simultaneous and even unconscious excitement of the intellect.

When I was a boy, I was very fond of music, and I am so now; and it so happened that I had the opportunity of hearing much good music. Among other things, I had abundant opportunities of hearing that great old master, Sebastian Bach. I remember perfectly well—though I knew nothing about music then, and, I may add, know nothing whatever about it now—the intense satisfaction and delight which I had in listening, by the hour together, to Bach's fugues. It is a pleasure which remains with me, I am glad to think; but, of late years, I have tried to find out the why and wherefore, and it has often occurred to me that the pleasure derived from musical compositions of this kind is essentially of the same nature as that which is derived from pursuits which are com-

monly regarded as purely intellectual. I mean that the source of pleasure is exactly the same as in most of my problems in morphology—that you have the theme in one of the old master's works followed out in all its endless variations, always appearing and always reminding you of unity in variety. So in painting; what is called "truth to nature" is the intellectual element coming in, and truth to nature depends entirely upon the intellectual culture of the person to whom art is addressed. If you are in Australia, you may get credit for being a good artist—I mean among the natives—if you can draw a kangaroo after a fashion. But, among men of higher civilization, the intellectual knowledge we possess brings its criticism into our appreciation of works of art, and we are obliged to satisfy it, as well as the mere sense of beauty in color and in outline. And so, the higher the culture and information of those whom art addresses, the more exact and precise must be what we call its "truth to nature."

If we turn to literature, the same thing is true, and you find works of literature which may be said to be pure art. A little song of Shakespeare or of Goethe is pure art; it is exquisitely beautiful, although its intellectual content may be nothing. A series of pictures is made to pass before your mind by the meaning of words, and the effect is a melody of ideas. Nevertheless, the great

mass of the literature we esteem is valued, not merely because of having artistic form, but because of its intellectual content; and the value is the higher the more precise, distinct, and true is that intellectual content. And, if you will let me for a moment speak of the very highest forms of literature, do we not regard them as highest simply because the more we know the truer they seem, and the more competent we are to appreciate beauty the more beautiful they are? No man ever understands Shakespeare until he is old, though the youngest may admire him, the reason being that he satisfies the artistic instinct of the youngest and harmonizes with the ripest and richest experience of the oldest.

I have said this much to draw your attention to what, to my mind, lies at the root of all this matter, and at the understanding of one another by the men of science on the one hand, and the men of literature, and history, and art, on the other. It is not a question whether one order of study or another should predominate. It is a question of what topics of education you shall select which will combine all the needful elements in such due proportion as to give the greatest amount of food, support, and encouragement to those faculties which enable us to appreciate truth, and to profit by those sources of innocent happiness which are open to us, and, at the same time, to avoid that

which is bad, and coarse, and ugly, and keep clear of the multitude of pitfalls and dangers which beset those who break through the natural or moral laws.

I address myself, in this spirit, to the consideration of the question of the value of purely literary education. Is it good and sufficient, or is it insufficient and bad? Well, here I venture to say that there are literary educations and literary educations. If I am to understand by that term the education that was current in the great majority of middle-class schools, and upper schools too, in this country when I was a boy, and which consisted absolutely and almost entirely in keeping boys for eight or ten years at learning the rules of Latin and Greek grammar, construing certain Latin and Greek authors, and possibly making verses which, had they been English verses, would have been condemned as abominable doggerel,—if that is what you mean by liberal education, then I say it is scandalously insufficient and almost worthless. My reason for saying so is not from the point of view of science at all, but from the point of view of literature. I say the thing professes to be literary education that is not a literary education at all. It was not literature at all that was taught, but science in a very bad form. It is quite obvious that grammar is science and not literature. The analysis of a text by the

help of the rules of grammar is just as much a scientific operation as the analysis of a chemical compound by the help of the rules of chemical analysis. There is nothing that appeals to the æsthetic faculty in that operation; and I ask multitudes of men of my own age, who went through this process, whether they ever had a conception of art or literature until they obtained it for themselves after leaving school? Then you may say, "If that is so, if the education was scientific, why cannot you be satisfied with it?" I say, because although it is a scientific training, it is of the most inadequate and inappropriate kind. If there is any good at all in scientific education it is that men should be trained, as I said before, to know things for themselves at first hand, and that they should understand every step of the reason of that which they do.

I desire to speak with the utmost respect of that science—philology—of which grammar is a part and parcel; yet everybody knows that grammar, as it is usually learned at school, affords no scientific training. It is taught just as you would teach the rules of chess or draughts. On the other hand, if I am to understand by a literary education the study of the literatures of either ancient or modern nations—but especially those of antiquity, and especially that of ancient Greece; if this literature is studied, not merely

from the point of view of philological science, and its practical application to the interpretation of texts, but as an exemplification of and commentary upon the principles of art; if you look upon the literature of a people as a chapter in the development of the human mind, if you work out this in a broad spirit, and with such collateral references to morals and politics, and physical geography, and the like as are needful to make you comprehend what the meaning of ancient literature and civilization is,—then, assuredly, it affords a splendid and noble education. But I still think it is susceptible of improvement, and that no man will ever comprehend the real secret of the difference between the ancient world and our present time, unless he has learned to see the difference which the late development of physical science has made between the thought of this day and the thought of that, and he will never see that difference, unless he has some practical insight into some branches of physical science; and you must remember that a literary education such as that which I have just referred to, is out of the reach of those whose school life is cut short at sixteen or seventeen.

But, you will say, all this is fault-finding; let us hear what you have in the way of positive suggestion. Then I am bound to tell you that, if I could make a clean sweep of everything—I am

very glad I cannot because I might, and probably should, make mistakes,—but if I could make a clean sweep of everything and start afresh, I should, in the first place, secure that training of the young in reading and writing, and in the habit of attention and observation, both to that which is told them, and that which they see, which everybody agrees to. But in addition to that, I should make it absolutely necessary for everybody, for a longer or shorter period, to learn to draw. Now, you may say, there are some people who cannot draw, however much they may be taught. I deny that *in toto*, because I never yet met with anybody who could not learn to write. Writing is a form of drawing; therefore if you give the same attention and trouble to drawing as you do to writing, depend upon it, there is nobody who cannot be made to draw, more or less well. Do not misapprehend me. I do not say for one moment you would make an artistic draughtsman. Artists are not made; they grow. You may improve the natural faculty in that direction, but you cannot make it; but you can teach simple drawing, and you will find it an implement of learning of extreme value. I do not think its value can be exaggerated, because it gives you the means of training the young in attention and accuracy, which are the two things in which all mankind are more deficient than in any other

mental quality whatever. The whole of my life has been spent in trying to give my proper attention to things and to be accurate, and I have not succeeded as well as I could wish; and other people, I am afraid, are not much more fortunate. You cannot begin this habit too early, and I consider there is nothing of so great a value as the habit of drawing, to secure those two desirable ends.

Then we come to the subject-matter, whether scientific or æsthetic, of education, and I should naturally have no question at all about teaching the elements of physical science of the kind I have sketched, in a practical manner; but among scientific topics, using the word scientific in the broadest sense, I would also include the elements of the theory of morals and of that of political and social life, which, strangely enough, it never seems to occur to anybody to teach a child. I would have the history of our own country, and of all the influences which have been brought to bear upon it, with incidental geography, not as a mere chronicle of reigns and battles, but as a chapter in the development of the race, and the history of civilization.

Then with respect to æsthetic knowledge and discipline, we have happily in the English language one of the most magnificent storehouses of artistic beauty and of models of literary excellence

which exists in the world at the present time. I have said before, and I repeat it here, that if a man cannot get literary culture of the highest kind out of his Bible, and Chaucer, and Shakespeare, and Milton, and Hobbes, and Bishop Berkeley, to mention only a few of our illustrious writers—I say, if he cannot get it out of those writers, he cannot get it out of anything; and I would assuredly devote a very large portion of the time of every English child to the careful study of the models of English writing of such varied and wonderful kind as we possess, and, what is still more important and still more neglected, the habit of using that language with precision, with force, and with art. I fancy we are almost the only nation in the world who seem to think that composition comes by nature. The French attend to their own language, the Germans study theirs; but Englishmen do not seem to think it is worth their while. Nor would I fail to include, in the course of study I am sketching, translations of all the best works of antiquity, or of the modern world. It is a very desirable thing to read Homer in Greek; but if you don't happen to know Greek, the next best thing we can do is to read as good a translation of it as we have recently been furnished with in prose. You won't get all you would get from the original, but you may get a great deal; and to refuse to know this great deal be-

cause you cannot get all, seems to be as sensible as for a hungry man to refuse bread because he cannot get partridge. Finally, I would add instruction in either music or painting, or, if the child should be so unhappy, as sometimes happens, as to have no faculty for either of those, and no possibility of doing anything in any artistic sense with them, then I would see what could be done with literature alone; but I would provide, in the fullest sense, for the development of the æsthetic side of the mind. In my judgment, those are all the essentials of education for an English child. With that outfit, such as it might be made in the time given to education which is within the reach of nine-tenths of the population—with that outfit, an Englishman, within the limits of English life, is fitted to go anywhere, to occupy the highest positions, to fill the highest offices of the State, and to become distinguished in practical pursuits, in science, or in art. For, if he have the opportunity to learn all those things, and have his mind disciplined in the various directions the teaching of those topics would have necessitated, then, assuredly, he will be able to pick up, on his road through life, all the rest of the intellectual baggage he wants.

If the educational time at our disposition were sufficient, there are one or two things I would add to those I have just now called the essentials; and

perhaps you will be surprised to hear, though I hope you will not, that I should add, not more science, but one, or, if possible, two languages. The knowledge of some other language than one's own is, in fact, of singular intellectual value. Many of the faults and mistakes of the ancient philosophers are traceable to the fact that they knew no language but their own, and were often led into confusing the symbol with the thought which it embodied. I think it is Locke who says that one-half of the mistakes of philosophers have arisen from questions about words; and one of the safest ways of delivering yourself from the bondage of words is, to know how ideas look in words to which you are not accustomed. That is one reason for the study of language; another reason is, that it opens new fields in art and in science. Another is the practical value of such knowledge; and yet another is this, that if your languages are properly chosen, from the time of learning the additional languages you will know your own language better than ever you did. So, I say, if the time given to education permits, add Latin and German. Latin, because it is the key to nearly one-half of English and to all the Romance languages; and German, because it is the key to almost all the remainder of English, and helps you to understand a race from whom most of us have sprung, and who have a character and

a literature of a fateful force in the history of the world, such as probably has been allotted to those of no other people, except the Jews, the Greeks, and ourselves. Beyond these, the essential and the eminently desirable elements of all education, let each man take up his special line—the historian devote himself to his history, the man of science to his science, the man of letters to his culture of that kind, and the artist to his special pursuit.

Bacon has prefaced some of his works with no more than this: *Franciscus Bacon sic cogitavit;* [1] let "sic cogitavi" be the epilogue to what I have ventured to address to you to-night.

[1] Thus thought Francis Bacon.

THE SOCIAL VALUE OF THE COLLEGE-BRED [1]

WILLIAM JAMES

Of what use is a college training? We who have had it seldom hear the question raised—we might be a little nonplussed to answer it offhand. A certain amount of meditation has brought me to this as the pithiest reply which I myself can give: The best claim that a college education can possibly make on your respect, the best thing it can aspire to accomplish for you, is this: that it should *help you to know a good man when you see him.* This is as true of women's as of men's colleges; but that it is neither a joke nor a one-sided abstraction I shall now endeavor to show.

What talk do we commonly hear about the contrast between college education and the education which business or technical or professional schools confer? The college education is called higher because it is supposed to be so general and so dis-

[1] An address delivered before The Association of American Alumnæ, at Radcliffe College, November 7, 1907. Reprinted, through special arrangement, from *McClure's Magazine.*

interested. At the " schools " you get a relatively narrow practical skill, you are told, whereas the " colleges " give you the more liberal culture, the broader outlook, the historical perspective, the philosophic atmosphere, or something which phrases of that sort try to express. You are made into an efficient instrument for doing a definite thing, you hear, at the schools; but, apart from that, you may remain a crude and smoky kind of petroleum, incapable of spreading light. The universities and colleges, on the other hand, although they may leave you less efficient for this or that practical task, suffuse your whole mentality with something more important than skill. They redeem you, make you well-bred; they make " good company " of you mentally. If they find you with a naturally boorish or caddish mind, they cannot leave you so, as a technical school may leave you. This, at least, is pretended; this is what we hear among college-trained people when they compare their education with every other sort. Now, exactly how much does this signify?

It is certain, to begin with, that the narrowest trade or professional training does something more for a man than to make a skilful practical tool of him—it makes him also a judge of other men's skill. Whether his trade be pleading at the bar or surgery or plastering or plumbing, it develops a critical sense in him for that sort of occupation.

He understands the difference between second-rate and first-rate work in his whole branch of industry; he gets to know a good job in his own line as soon as he sees it; and getting to know this in his own line, he gets a faint sense of what good work may mean anyhow, that may, if circumstances favor, spread into his judgments elsewhere. Sound work, clean work, finished work: feeble work, slack work, sham work—these words express an identical contrast in many different departments of activity. In so far forth, then, even the humblest manual trade may beget in one a certain small degree of power to judge of good work generally.

Now, what is supposed to be the line of us who have the higher college training? Is there any broader line—since our education claims primarily not to be "narrow"—in which we also are made good judges between what is first-rate and what is second-rate only? What is especially taught in the colleges has long been known by the name of the "humanities," and these are often identified with Greek and Latin. But it is only as literatures, not as languages, that Greek and Latin have any general humanity-value; so that in a broad sense the humanities mean literature primarily, and in a still broader sense, the study of masterpieces in almost any field of human endeavor. Literature keeps the primacy; for it not

only *consists* of masterpieces, but is largely *about* masterpieces, being little more than an appreciative chronicle of human master-strokes, so far as it takes the form of criticism and history. You can give humanistic value to almost anything by teaching it historically. Geology, economics, mechanics, are humanities when taught with reference to the successive achievements of the geniuses to which these sciences owe their being. Not taught thus, literature remains grammar, art a catalogue, history a list of dates, and natural science a sheet of formulas and weights and measures.

The sifting of human creations!—nothing less than this is what we ought to mean by the humanities. Essentially this means biography; what our colleges should teach is, therefore, biographical history, that not of politics merely, but of anything and everything so far as human efforts and conquests are factors that have played their part. Studying in this way, we learn what types of activity have stood the test of time; we acquire standards of the excellent and durable. All our arts and sciences and institutions are but so many quests of perfection on the part of men; and when we see how diverse the types of excellence may be, how various the tests, how flexible the adaptations, we gain a richer sense of what the terms "better" and "worse" may signify in general. Our crit-

ical sensibilities grow both more acute and less fanatical. We sympathize with men's mistakes even in the act of penetrating them; we feel the pathos of lost causes and misguided epochs even while we applaud what overcame them.

Such words are vague and such ideas are inadequate, but their meaning is unmistakable. What the colleges—teaching humanities by examples which may be special, but which must be typical and pregnant—should at least try to give us, is a general sense of what, under various disguises, *superiority* has always signified and may still signify. The feeling for a good human job anywhere, the admiration of the really admirable, the disesteem of what is cheap and trashy and impermanent—this is what we call the critical sense, the sense for ideal values. It is the better part of what men know as wisdom. Some of us are wise in this way naturally and by genius; some of us never become so. But to have spent one's youth at college, in contact with the choice and rare and precious, and yet still to be a blind prig or vulgarian, unable to scent out human excellence or to divine it amid its accidents, to know it only when ticketed and labelled and forced on us by others, this indeed should be accounted the very calamity and shipwreck of a higher education.

The sense for human superiority ought, then, to be considered our line, as boring subways is

the engineer's line and the surgeon's is appendicitis. Our colleges ought to have lit up in us a lasting relish for the better kind of man, a loss of appetite for mediocrities, and a disgust for cheapjacks. We ought to smell, as it were, the difference of quality in men and their proposals when we enter the world of affairs about us. Expertness in this might well atone for some of our awkwardness at accounts, for some of our ignorance of dynamos. The best claim we can make for the higher education, the best single phrase in which we can tell what it ought to do for us, is, then, exactly what I said: it should enable us to *know a good man when we see him.*

That the phrase is anything but an empty epigram follows from the fact that if you ask in what line it is most important that a democracy like ours should have its sons and daughters skilful, you see that it is this line more than any other. "The people in their wisdom"—this is the kind of wisdom most needed by the people. Democracy is on its trial, and no one knows how it will stand the ordeal. Abounding about us are pessimistic prophets. Fickleness and violence used to be, but are no longer, the vices which they charge to democracy. What its critics now affirm is that its preferences are inveterately for the inferior. So it was in the beginning, they say, and so it will be world without end. Vulgarity enthroned

and institutionalized, elbowing everything superior from the highway, this, they tell us, is our irremediable destiny; and the picture-papers of the European continent are already drawing Uncle Sam with the hog instead of the eagle for his heraldic emblem. The privileged aristocracies of the foretime, with all their iniquities, did at least preserve some taste for higher human quality and honor certain forms of refinement by their enduring traditions. But when democracy is sovereign, its doubters say, nobility will form a sort of invisible church, and sincerity and refinement, stripped of honor, precedence, and favor, will have to vegetate on sufferance in private corners. They will have no general influence. They will be harmless eccentricities.

Now, who can be absolutely certain that this may not be the career of democracy? Nothing future is quite secure; states enough have inwardly rotted; and democracy as a whole may undergo self-poisoning. But, on the other hand, democracy is a kind of religion, and we are bound not to admit its failure. Faiths and utopias are the noblest exercise of human reason, and no one with a spark of reason in him will sit down fatalistically before the croaker's picture. The best of us are filled with the contrary vision of a democracy stumbling through every error till its institutions glow with justice and its customs shine with

beauty. Our better men *shall* show the way and we *shall* follow them; so we are brought round again to the mission of the higher education in helping us to know the better kind of man whenever we see him.

The notion that a people can run itself and its affairs anonymously is now well known to be the silliest of absurdities. Mankind does nothing save through initiatives on the part of inventors, great or small, and imitation by the rest of us—these are the sole factors active in human progress. Individuals of genius show the way, and set the patterns, which common people then adopt and follow. *The rivalry of the patterns is the history of the world.* Our democratic problem thus is statable in ultra-simple terms: Who are the kind of men from whom our majorities shall take their cue? Whom shall they treat as rightful leaders? We and our leaders are the x and the y of the equation here; all other historic circumstances, be they economical, political, or intellectual, are only the background of occasion on which the living drama works itself out between us.

In this very simple way does the value of our educated class define itself: we more than others should be able to divine the worthier and better leaders. The terms here are monstrously simplified, of course, but such a bird's-eye view lets us immediately take our bearings. In our democracy,

where everything else is so shifting, we alumni and alumnæ of the colleges are the only permanent presence that corresponds to the aristocracy in older countries. We have continuous traditions, as they have; our motto, too, is *noblesse oblige;* and, unlike them, we stand for ideal interests solely, for we have no corporate selfishness and wield no powers of corruption. We ought to have our own class-consciousness. "Les intellectuels"! What prouder club-name could there be than this one, used ironically by the party of "red blood," the party of every stupid prejudice and passion, during the anti-Dreyfus craze, to satirize the men in France who still retained some critical sense and judgment![1] Critical sense, it has to be confessed, is not an exciting term, hardly a banner to carry in processions. Affections for old habit, currents of self-interest, and gales of passion are the forces that keep the human ship moving; and the pressure of the judicious pilot's hand upon the tiller is a relatively insignificant energy. But the affections, passions, and interest are shifting, successive, and distraught; they blow in alternation while the pilot's hand is steadfast. He knows the compass, and, with all the leeways he is obliged

[1] Alfred Dreyfus, a captain, of Jewish descent, in the French army, was in 1894 convicted by a secret military tribunal of having divulged state secrets to a foreign power. In 1906 Dreyfus was completely vindicated.

to tack toward, he always makes some headway. A small force, if it never lets up, will accumulate effects more considerable than those of much greater forces if these work inconsistently. The ceaseless whisper of the more permanent ideals, the steady tug of truth and justice, give them but time, *must* warp the world in their direction.

This bird's-eye view of the general steering function of the college-bred amid the driftings of democracy ought to help us to a wider vision of what our colleges themselves should aim at. If we are to be the yeast-cake for democracy's dough, if we are to make it rise with culture's preferences, we must see to it that culture spreads broad sails. We must shake the old double reefs out of the canvas into the wind and sunshine, and let in every modern subject, sure that any subject will prove humanistic, if its setting be kept only wide enough.

Stevenson says somewhere to his reader: "You think you are just making this bargain, but you are really laying down a link in the policy of mankind." Well, your technical school should enable you to make your bargain splendidly; but your college should show you just the place of that kind of bargain—a pretty poor place, possibly—in the whole policy of mankind. That is the kind of liberal outlook, of perspective, of at-

mosphere, which should surround every subject as a college deals with it.

We of the colleges must eradicate a curious notion which numbers of good people have about such ancient seats of learning as Harvard. To many ignorant outsiders, that name suggests little more than a kind of sterilized conceit and incapacity for being pleased. In Edith Wyatt's exquisite book of Chicago sketches called *Every One His Own Way*, there is a couple who stand for culture in the sense of exclusiveness, Richard Elliot and his feminine counterpart—feeble caricatures of mankind, unable to know any good thing when they see it, incapable of enjoyment unless a printed label gives them leave. Possibly this type of culture may exist near Cambridge and Boston, there may be specimens there, for priggishness is just like painter's colic or any other trade-disease. But every good college makes its students immune against this malady, of which the microbe haunts the neighborhood-printed pages. It does so by its general tone being too hearty for the microbe's life. Real culture lives by sympathies and admirations, not by dislikes and disdains—under all misleading wrappings it pounces unerringly upon the human core. If a college, through the inferior human influences that have grown regnant there, fails to catch the robuster tone, its failure is colossal, for its social function

stops: democracy gives it a wide berth, turns toward it a deaf ear.

"Tone," to be sure, is a terribly vague word to use, but there is no other, and this whole meditation is over questions of tone. By their tone are all things human either lost or saved. If democracy is to be saved it must catch the higher, healthier tone. If we are to impress it with our preferences, we ourselves must use the proper tone, which we, in turn, must have caught from our own teachers. It all reverts in the end to the action of innumerable imitative individuals upon each other and to the question of whose tone has the highest spreading power. As a class, we college graduates should look to it that *ours* has spreading power. It ought to have the highest spreading power.

In our essential function of indicating the better men, we now have formidable competitors outside. *McClure's Magazine*, the *American Magazine*, *Collier's Weekly* and, in its fashion, the *World's Work*, constitute together a real popular university along this very line. It would be a pity if any future historian were to have to write words like these: "By the middle of the twentieth century the higher institutions of learning had lost all influence over public opinion in the United States. But the mission of raising the tone of democracy, which they had proved themselves so

lamentably unfitted to exert, was assumed with rare enthusiasm and prosecuted with extraordinary skill and success by a new educational power; and for the clarification of their human sympathies and elevation of their human preferences, the people at large acquired the habit of resorting exclusively to the guidance of certain private literary adventures, commonly designated in the market by the affectionate name of ten-cent magazines."

Must not we of the colleges see to it that no historian shall ever say anything like this? Vague as the phrase of knowing a good man when you see him may be, diffuse and indefinite as one must leave its application, is there any other formula that describes so well the result at which our institutions *ought* to aim? If they do that, they do the best thing conceivable. If they fail to do it, they fail in very deed. It surely is a fine synthetic formula. If our faculties and graduates could once collectively come to realize it as the great underlying purpose toward which they have always been more or less obscurely groping, a great clearness would be shed over many of their problems; and, as for their influence in the midst of our social system, it would embark upon a new career of strength.

ON THE ADVISABLENESS OF IMPROVING NATURAL KNOWLEDGE[1]

THOMAS HENRY HUXLEY

This time two hundred years ago—in the beginning of January, 1666—those of our forefathers who inhabited this great and ancient city, took breath between the shocks of two fearful calamities: one not quite past, although its fury had abated; the other to come.

Within a few yards of the very spot on which we are assembled, so the tradition runs, that painful and deadly malady, the plague, appeared in the latter months of 1664; and, though no new visitor, smote the people of England, and especially of her capital, with a violence unknown before, in the course of the following year. The hand of a master has pictured what happened in those dismal months; and in that truest of fictions, *The History of the Plague Year*, Defoe shows death, with every accompaniment of pain and terror, stalking through the narrow streets

[1] An address delivered in St. Martin's Hall, London, January 7, 1866.

of old London, and changing their busy hum into a silence broken only by the wailing of the mourners of fifty thousand dead; by the woful denunciations and mad prayers of fanatics; and by the madder yells of despairing profligates.

But, about this time in 1666, the death-rate had sunk to nearly its ordinary amount; a case of plague occurred only here and there, and the richer citizens who had flown from the pest had returned to their dwellings. The remnant of the people began to toil at the accustomed round of duty, or of pleasure; and the stream of city life bid fair to flow back along its old bed, with renewed and uninterrupted vigor.

The newly kindled hope was deceitful. The great plague, indeed, returned no more; but what it had done for the Londoners, the great fire, which broke out in the autumn of 1666, did for London; and, in September of that year, a heap of ashes and the indestructible energy of the people were all that remained of the glory of five-sixths of the city within the walls.

Our forefathers had their own ways of accounting for each of these calamities. They submitted to the plague in humility and in penitence, for they believed it to be the judgment of God. But, towards the fire they were furiously indignant, interpreting it as the effect of the malice of man,

—as the work of the Republicans, or of the Papists, according as their prepossessions ran in favor of loyalty or of Puritanism.

It would, I fancy, have fared but ill with one who, standing where I now stand, in what was then a thickly peopled and fashionable part of London, should have broached to our ancestors the doctrine which I now propound to you—that all their hypotheses were alike wrong; that the plague was no more, in their sense, Divine judgment, than the fire was the work of any political, or of any religious, sect; but that they were themselves the authors of both plague and fire, and that they must look to themselves to prevent the recurrence of calamities, to all appearance so peculiarly beyond the reach of human control—so evidently the result of the wrath of God, or of the craft and subtlety of an enemy.

And one may picture to oneself how harmoniously the holy cursing of the Puritan of that day would have chimed in with the unholy cursing and the crackling wit of the Rochesters and Sedleys, and with the revilings of the political fanatics, if my imaginary plain dealer had gone on to say that, if the return of such misfortunes were ever rendered impossible, it would not be in virtue of the victory of the faith of Laud,[1] or of that of

[1] William Laud (1573–1645), Archbishop of Canterbury, an ardent opponent of Puritanism.

Milton; and, as little, by the triumph of republicanism, as by that of monarchy. But that the one thing needful for compassing this end was, that the people of England should second the efforts of an insignificant corporation, the establishment of which, a few years before the epoch of the great plague and the great fire, had been as little noticed, as they were conspicuous.

Some twenty years before the outbreak of the plague a few calm and thoughtful students banded themselves together for the purpose, as they phrased it, of "improving natural knowledge." The ends they proposed to attain cannot be stated more clearly than in the words of one of the founders of the organisation:—

"Our business was (precluding matters of theology and state affairs) to discourse and consider of philosophical enquiries, and such as related thereunto:—as Physick, Anatomy, Geometry, Astronomy, Navigation, Staticks, Magneticks, Chymicks, Mechanicks, and Natural Experiments; with the state of these studies and their cultivation at home and abroad. We then discoursed of the circulation of the blood, the valves in the veins, the venæ lacteæ,[1] the lymphatic vessels, the Copernican hypothesis, the nature of comets and new stars, the satellites of Jupiter, the oval shape

[1] The lacteal vessels. The term is now obsolete.

(as it then appeared) of Saturn, the spots on the sun and its turning on its own axis, the inequalities and selenography of the moon, the several phases of Venus and Mercury, the improvement of telescopes and grinding of glasses for that purpose, the weight of air, the possibility or impossibility of vacuities and nature's abhorrence thereof, the Torricellian experiment in quicksilver, the descent of heavy bodies and the degree of acceleration therein, with divers other things of like nature, some of which were then but new discoveries, and others not so generally known and embraced as now they are; with other things appertaining to what hath been called the New Philosophy, which, from the times of Galileo at Florence, and Sir Francis Bacon (Lord Verulam) in England, hath been much cultivated in Italy, France, Germany, and other parts abroad, as well as with us in England."

The learned Dr. Wallis, writing in 1696, narrates, in these words, what happened half a century before, or about 1645. The associates met at Oxford, in the rooms of Dr. Wilkins, who was destined to become a bishop; and subsequently coming together in London, they attracted the notice of the king. And it is a strange evidence of the taste for knowledge which the most obviously worthless of the Stuarts shared with his father and grandfather, that Charles the Second

was not content with saying witty things about his philosophers, but did wise things with regard to them. For he not only bestowed upon them such attention as he could spare from his poodles and his mistresses, but, being in his usual state of impecuniosity, begged for them of the Duke of Ormond; and, that step being without effect, gave them Chelsea College, a charter, and a mace: crowning his favors in the best way they could be crowned, by burdening them no further with royal patronage or state interference.

Thus it was that the half-dozen young men, studious of the "New Philosophy," who met in one another's lodgings in Oxford or in London, in the middle of the seventeenth century, grew in numerical and in real strength, until, in its latter part, the "Royal Society for the Improvement of Natural Knowledge" had already become famous, and had acquired a claim upon the veneration of Englishmen, which it has ever since retained, as the principal focus of scientific activity in our islands, and the chief champion of the cause it was formed to support.

It was by the aid of the Royal Society that Newton published his *Principia*. If all the books in the world, except the *Philosophical Transactions*, were destroyed, it is safe to say that the foundations of physical science would remain unshaken, and that the vast intellectual progress of

the last two centuries would be largely, though incompletely, recorded. Nor have any signs of halting or of decrepitude manifested themselves in our own times. As in Dr. Wallis's days, so in these, "our business is, precluding theology and state affairs, to discourse and consider of philosophical enquiries." But our "Mathematick" is one which Newton would have to go to school to learn; our "Staticks, Mechanicks, Magneticks, Chymicks, and Natural Experiments" constitute a mass of physical and chemical knowledge, a glimpse at which would compensate Galileo for the doings of a score of inquisitorial cardinals; our "Physick" and "Anatomy" have embraced such infinite varieties of being, have laid open such new worlds in time and space, have grappled, not unsuccessfully, with such complex problems, that the eyes of Vesalius [1] and of Harvey might be dazzled by the sight of the tree that has grown out of their grain of mustard seed.

The fact is perhaps rather too much, than too little, forced upon one's notice, nowadays, that all this marvellous intellectual growth has a no less wonderful expression in practical life; and that, in this respect, if in no other, the movement symbolized by the progress of the Royal Society stands without a parallel in the history of mankind.

[1] A Belgian anatomist (1514–1564).

A series of volumes as bulky as the *Transactions of the Royal Society* might possibly be filled with the subtle speculations of the Schoolmen; not improbably, the obtaining a mastery over the products of mediæval thought might necessitate an even greater expenditure of time and of energy than the acquirement of the "New Philosophy"; but though such work engrossed the best intellects of Europe for a longer time than has elapsed since the great fire, its effects were "writ in water," so far as our social state is concerned.

On the other hand, if the noble first President of the Royal Society could revisit the upper air and once more gladden his eyes with a sight of the familiar mace, he would find himself in the midst of a material civilization more different from that of his day, than that of the seventeenth, was from that of the first, century. And if Lord Brouncker's native sagacity had not deserted his ghost, he would need no long reflection to discover that all these great ships, these railways, these telegraphs, these factories, these printing-presses, without which the whole fabric of modern English society would collapse into a mass of stagnant and starving pauperism,—that all these pillars of our State are but the ripples and the bubbles upon the surface of that great spiritual stream, the springs of which, only, he and his fellows were privileged to see; and seeing, to recognize as that

which it behoved them above all things to keep pure and undefiled.

It may not be too great a flight of imagination to conceive our noble *revenant* not forgetful of the great troubles of his own day, and anxious to know how often London had been burned down since his time, and how often the plague had carried off its thousands. He would have to learn that, although London contains tenfold the inflammable matter that it did in 1666; though, not content with filling our rooms with woodwork and light draperies, we must needs lead inflammable and explosive gases into every corner of our streets and houses, we never allow even a street to burn down. And if he asked how this had come about, we should have to explain that the improvement of natural knowledge has furnished us with dozens of machines for throwing water upon fires, any one of which would have furnished the ingenious Mr. Hooke, the first "curator and experimenter" of the Royal Society, with ample materials for discourse before half a dozen meetings of that body; and that, to say truth, except for the progress of natural knowledge, we should not have been able to make even the tools by which these machines are constructed. And, further, it would be necessary to add, that although severe fires sometimes occur and inflict great damage, the loss is very generally compensated by societies,

the operations of which have been rendered possible only by the progress of natural knowledge in the direction of mathematics, and the accumulation of wealth in virtue of other natural knowledge.

But the plague? My Lord Brouncker's observation would not, I fear, lead him to think that Englishmen of the nineteenth century are purer in life, or more fervent in religious faith, than the generation which could produce a Boyle,[1] an Evelyn,[2] and a Milton. He might find the mud of society at the bottom, instead of at the top, but I fear that the sum total would be as deserving of swift judgment as at the time of the Restoration. And it would be our duty to explain once more, and this time not without shame, that we have no reason to believe that it is the improvement of our faith, nor that of our morals, which keeps the plague from our city; but, again, that it is the improvement of our natural knowledge.

We have learned that pestilences will only take up their abode among those who have prepared unswept and ungarnished residences for them. Their cities must have narrow, unwatered streets, foul with accumulated garbage. Their houses must be ill-drained, ill-lighted, ill-ventilated. Their subjects must be ill-washed, ill-fed, ill-

[1] Robert Boyle (1627–1691), renowned chemist and physicist.
[2] John Evelyn (1620–1706), chiefly notable for his *Diary*.

clothed. The London of 1665 was such a city. The cities of the East, where plague has an enduring dwelling, are such cities. We, in later times, have learned somewhat of Nature, and partly obey her. Because of this partial improvement of our natural knowledge and of that fractional obedience, we have no plague; because that knowledge is still very imperfect and that obedience yet incomplete, typhus is our companion and cholera our visitor. But it is not presumptuous to express the belief that, when our knowledge is more complete and our obedience the expression of our knowledge, London will count her centuries of freedom from typhus and cholera, as she now gratefully reckons her two hundred years of ignorance of that plague which swooped upon her thrice in the first half of the seventeenth century.

Surely, there is nothing in these explanations which is not fully borne out by the facts? Surely, the principles involved in them are now admitted among the fixed beliefs of all thinking men? Surely, it is true that our countrymen are less subject to fire, famine, pestilence, and all the evils which result from a want of command over and due anticipation of the course of Nature, than were the countrymen of Milton; and health, wealth, and well-being are more abundant with us than with them? But no less certainly is the difference due

to the improvement of our knowledge of Nature, and the extent to which that improved knowledge has been incorporated with the household words of men, and has supplied the springs of their daily actions.

Granting for a moment, then, the truth of that which the depreciators of natural knowledge are so fond of urging, that its improvement can only add to the resources of our material civilization; admitting it to be possible that the founders of the Royal Society themselves looked for no other reward than this, I cannot confess that I was guilty of exaggeration when I hinted, that to him who had the gift of distinguishing between prominent events and important events, the origin of a combined effort on the part of mankind to improve natural knowledge might have loomed larger than the Plague and have outshone the glare of the Fire; as a something fraught with a wealth of beneficence to mankind, in comparison with which the damage done by those ghastly evils would shrink into insignificance.

It is very certain that for every victim slain by the plague, hundreds of mankind exist and find a fair share of happiness in the world, by the aid of the spinning jenny. And the great fire, at its worst, could not have burned the supply of coal, the daily working of which, in the bowels of the earth, made possible by the steam pump, gives rise

to an amount of wealth to which the millions lost in old London are but as an old song.

But spinning jenny and steam pump are, after all, but toys, possessing an accidental value; and natural knowledge creates multitudes of more subtle contrivances, the praises of which do not happen to be sung because they are not directly convertible into instruments for creating wealth. When I contemplate natural knowledge squandering such gifts among men, the only appropriate comparison I can find for her is, to liken her to such a peasant woman as one sees in the Alps, striding ever upward, heavily burdened, and with mind bent only on her home; but yet, without effort and without thought, knitting for her children. Now stockings are good and comfortable things, and the children will undoubtedly be much the better for them; but surely it would be short-sighted, to say the least of it, to depreciate this toiling mother as a mere stocking-machine—a mere provider of physical comforts?

However, there are blind leaders of the blind, and not a few of them, who take this view of natural knowledge, and can see nothing in the bountiful mother of humanity but a sort of comfort-grinding machine. According to them, the improvement of natural knowledge always has been, and always must be, synonymous with no more

than the improvement of the material resources and the increase of the gratifications of men.

Natural knowledge is, in their eyes, no real mother of mankind, bringing them up with kindness, and, if need be, with sternness, in the way they should go, and instructing them in all things needful for their welfare; but a sort of fairy godmother, ready to furnish her pets with shoes of swiftness, swords of sharpness, and omnipotent Aladdin's lamps, so that they may have telegraphs to Saturn, and see the other side of the moon, and thank God they are better than their benighted ancestors.

If this talk were true, I, for one, should not greatly care to toil in the service of natural knowledge. I think I would just as soon be quietly chipping my own flint axe, after the manner of my forefathers a few thousand years back, as be troubled with the endless malady of thought which now infests us all, for such reward. But I venture to say that such views are contrary alike to reason and to fact. Those who discourse in such fashion seem to me to be so intent upon trying to see what is above Nature, or what is behind her, that they are blind to what stares them in the face, in her.

I should not venture to speak thus strongly if my justification were not to be found in the simplest and most obvious facts,—if it needed more

than an appeal to the most notorious truths to justify my assertion, that the improvement of natural knowledge, whatever direction it has taken, and however low the aims of those who may have commenced it—has not only conferred practical benefits on men, but, in so doing, has effected a revolution in their conceptions of the universe and of themselves, and has profoundly altered their modes of thinking and their views of right and wrong. I say that natural knowledge, seeking to satisfy natural wants, has found the ideas which can alone still spiritual cravings. I say that natural knowledge, in desiring to ascertain the laws of comfort, has been driven to discover those of conduct, and to lay the foundations of a new morality.

Let us take these points separately; and, first, what great ideas has natural knowledge introduced into men's minds?

I cannot but think that the foundations of all natural knowledge were laid when the reason of man first came face to face with the facts of Nature: when the savage first learned that the fingers of one hand are fewer than those of both; that it is shorter to cross a stream than to head it; that a stone stops where it is unless it be moved, and that it drops from the hand which lets it go; that light and heat come and go with the sun; that

sticks burn away in a fire; that plants and animals grow and die; that if he struck his fellow-savage a blow he would make him angry, and perhaps get a blow in return, while if he offered him a fruit he would please him, and perhaps receive a fish in exchange. When men had acquired this much knowledge, the outlines, rude though they were, of mathematics, of physics, of chemistry, of biology, of moral, economical, and political science, were sketched. Nor did the germ of religion fail when science began to bud. Listen to words which, though new, are yet three thousand years old:—

> . . . . When in heaven the stars about the moon
> Look beautiful, when all the winds are laid,
> And every height comes out, and jutting peak
> And valley, and the immeasurable heavens
> Break open to their highest, and all the stars
> Shine, and the shepherd gladdens in his heart.[1]

If the half-savage Greek could share our feelings thus far, it is irrational to doubt that he went further, to find, as we do, that upon that brief gladness there follows a certain sorrow,—the little light of awakened human intelligence shines so mere a spark amidst the abyss of the unknown and unknowable; seems so insufficient to do more than illuminate the imperfections that cannot be

[1] Need it be said that this is Tennyson's English for Homer's Greek? [Author's note.]

remedied, the aspirations that cannot be realized, of man's own nature. But in this sadness, this consciousness of the limitation of man, this sense of an open secret which he cannot penetrate, lies the essence of all religion; and the attempt to embody it in the forms furnished by the intellect is the origin of the higher theologies.

Thus it seems impossible to imagine but that the foundations of all knowledge—secular or sacred—were laid when intelligence dawned, though the superstructure remained for long ages so slight and feeble as to be compatible with the existence of almost any general view respecting the mode of governance of the universe. No doubt, from the first, there were certain phenomena which, to the rudest mind, presented a constancy of occurrence, and suggested that a fixed order ruled, at any rate, among them. I doubt if the grossest of Fetish worshippers ever imagined that a stone must have a god within it to make it fall, or that a fruit had a god within it to make it taste sweet. With regard to such matters as these, it is hardly questionable that mankind from the first took strictly positive and scientific views.

But, with respect to all the less familiar occurrences which present themselves, uncultured man, no doubt, has always taken himself as the standard of comparison, as the centre and measure of the world; nor could he well avoid doing so.

And finding that his apparently uncaused will has a powerful effect in giving rise to many occurrences, he naturally enough ascribed other and greater events to other and greater volitions, and came to look upon the world and all that therein is, as the product of the volitions of persons like himself, but stronger, and capable of being appeased or angered, as he himself might be soothed or irritated. Through such conceptions of the plan and working of the universe all mankind have passed, or are passing. And we may now consider, what has been the effect of the improvement of natural knowledge on the views of men who have reached this stage, and who have begun to cultivate natural knowledge with no desire but that of "increasing God's honor and bettering man's estate."

For example: what could seem wiser, from a mere material point of view, more innocent, from a theological one, to an ancient people, than that they should learn the exact succession of the seasons, as warnings for their husbandmen; or the position of the stars, as guides to their rude navigators? But what has grown out of this search for natural knowledge of so merely useful a character? You all know the reply. Astronomy,—which of all sciences has filled men's minds with general ideas of a character most foreign to their daily experience, and has, more than any other,

rendered it impossible for them to accept the beliefs of their fathers. Astronomy,—which tells them that this so vast and seemingly solid earth is but an atom among atoms, whirling, no man knows whither, through illimitable space; which demonstrates that what we call the peaceful heaven above us, is but that space, filled by an infinitely subtle matter whose particles are seething and surging, like the waves of an angry sea; which opens up to us infinite regions where nothing is known, or ever seems to have been known, but matter and force, operating according to rigid rules; which leads us to contemplate phenomena the very nature of which demonstrates that they must have had a beginning, and that they must have an end, but the very nature of which also proves that the beginning was, to our conceptions of time, infinitely remote, and that the end is as immeasurably distant.

But it is not alone those who pursue astronomy who ask for bread and receive ideas. What more harmless than the attempt to lift and distribute water by pumping it; what more absolutely and grossly utilitarian? But out of pumps grew the discussions about Nature's abhorrence of a vacuum; and then it was discovered that Nature does not abhor a vacuum, but that air has weight; and that notion paved the way for the doctrine that all matter has weight, and that the force which

produces weight is co-extensive with the universe, —in short, to the theory of universal gravitation and endless force. While learning how to handle gases led to the discovery of oxygen, and to modern chemistry, and to the notion of the indestructibility of matter.

Again, what simpler, or more absolutely practical, than the attempt to keep the axle of a wheel from heating when the wheel turns round very fast? How useful for carters and gig drivers to know something about this; and how good were it, if any ingenious person would find out the cause of such phenomena, and thence educe a general remedy for them. Such an ingenious person was Count Rumford;[1] and he and his successors have landed us in the theory of the persistence, or indestructibility, of force. And in the infinitely minute, as in the infinitely great, the seekers after natural knowledge, of the kinds called physical and chemical, have everywhere found a definite order and succession of events which seem never to be infringed.

And how has it fared with "Physick" and anatomy? Have the anatomist, the physiologist, or the physician, whose business it has been to devote themselves assiduously to that eminently practical and direct end, the alleviation of the

[1] Benjamin Thompson (1753–1814), a distinguished American scientist.

sufferings of mankind,—have they been able to confine their vision more absolutely to the strictly useful? I fear they are worst offenders of all. For if the astronomer has set before us the infinite magnitude of space, and the practical eternity of the duration of the universe; if the physical and chemical philosophers have demonstrated the infinite minuteness of its constituent parts, and the practical eternity of matter and of force; and if both have alike proclaimed the universality of a definite and predicable order and succession of events, the workers in biology have not only accepted all these, but have added more startling theses of their own. For, as the astronomers discover in the earth no centre of the universe, but an eccentric speck, so the naturalists find man to be no centre of the living world, but one amidst endless modifications of life; and as the astronomer observes the mark of practically endless time set upon the arrangements of the solar system so the student of life finds the records of ancient forms of existence peopling the world for ages, which, in relation to human experience, are infinite.

Furthermore, the physiologist finds life to be as dependent for its manifestation on particular molecular arrangements as any physical or chemical phenomenon; and, wherever he extends his researches, fixed order and unchanging causation

reveal themselves, as plainly as in the rest of Nature.

Nor can I find that any other fate has awaited the germ of Religion. Arising, like all other kinds of knowledge, out of the action and interaction of man's mind, with that which is not man's mind, it has taken the intellectual coverings of fetishism or polytheism: of theism or atheism; of superstition or rationalism. With these, and their relative merits and demerits, I have nothing to do; but this it is needful for my purpose to say, that if the religion of the present differs from that of the past, it is because the theology of the present has become more scientific than that of the past; because it has not only renounced idols of wood and idols of stone, but begins to see the necessity of breaking in pieces the idols built up of books and traditions and fine-spun ecclesiastical cobwebs: and of cherishing the noblest and most human of man's emotions, by worship "for the most part of the silent sort" at the altar of the Unknown and Unknowable.[1]

Such are a few of the new conceptions implanted in our minds by the improvement of natural knowledge. Men have acquired the ideas of the practically infinite extent of the universe and of its practical eternity; they are familiar with the conception that our earth is but an infinitesimal frag-

[1] An allusion to *Acts* xvii. 23.

ment of that part of the universe which can be seen; and that, nevertheless, its duration is, as compared with our standards of time, infinite. They have further acquired the idea that man is but one of innumerable forms of life now existing in the globe, and that the present existences are but the last of an immeasurable series of predecessors. Moreover, every step they have made in natural knowledge has tended to extend and rivet in their minds the conception of a definite order of the universe—which is embodied in what are called, by an unhappy metaphor, the laws of Nature—and to narrow the range and loosen the force of men's belief in spontaneity, or in changes other than such as arise out of that definite order itself.

Whether these ideas are well or ill founded is not the question. No one can deny that they exist, and have been the inevitable outgrowth of the improvement of natural knowledge. And if so, it cannot be doubted that they are changing the form of men's most cherished and most important convictions.

And as regards the second point—the extent to which the improvement of natural knowledge has remodelled and altered what may be termed the intellectual ethics of men,—what are among the

moral convictions most fondly held by barbarous and semi-barbarous people?

They are the convictions that authority is the soundest basis of belief; that merit attaches to a readiness to believe; that the doubting disposition is a bad one, and scepticism a sin; that when good authority has pronounced what is to be believed, and faith has accepted it, reason has no further duty. There are many excellent persons who yet hold by these principles, and it is not my present business, or intention, to discuss their views. All I wish to bring clearly before your minds is the unquestionable fact, that the improvement of natural knowledge is effected by methods which directly give the lie to all these convictions, and assume the exact reverse of each to be true.

The improver of natural knowledge absolutely refuses to acknowledge authority, as such. For him, scepticism is the highest of duties; blind faith the one unpardonable sin. And it cannot be otherwise, for every great advance in natural knowledge has involved the absolute rejection of authority, the cherishing of the keenest scepticism, the annihilation of the spirit of blind faith; and the most ardent votary of science holds his firmest convictions, not because the men he most venerates hold them; not because their verity is testified by portents and wonders; but because his experience teaches him that whenever he chooses to bring

these convictions into contact with their primary source, Nature—whenever he thinks fit to test them by appealing to experiment and to observation—Nature will confirm them. The man of science has learned to believe in justification, not by faith, but by verification.

Thus, without for a moment pretending to despise the practical results of the improvement of natural knowledge, and its beneficial influence on material civilization, it must, I think, be admitted that the great ideas, some of which I have indicated, and the ethical spirit which I have endeavored to sketch, in the few moments which remained at my disposal, constitute the real and permanent significance of natural knowledge.

If these ideas be destined, as I believe they are, to be more and more firmly established as the world grows older; if that spirit be fated, as I believe it is, to extend itself into all departments of human thought, and to become co-extensive with the range of knowledge; if, as our race approaches its maturity, it discovers, as I believe it will, that there is but one kind of knowledge and but one method of acquiring it; then we, who are still children, may justly feel it our highest duty to recognize the advisableness of improving natural knowledge, and so to aid ourselves and our successors in their course towards the noble goal which lies before mankind.

ON THE EDUCATIONAL VALUE OF THE NATURAL HISTORY SCIENCES[1]

THOMAS HENRY HUXLEY

The subject to which I have to beg your attention during the ensuing hour is "The Relation of Physiological Science to Other Branches of Knowledge."

Had circumstances permitted of the delivery, in their strict logical order, of that series of discourses of which the present lecture is a member, I should have preceded my friend and colleague Mr. Henfrey, who addressed you on Monday last; but while, for the sake of that order, I must beg you to suppose that this discussion of the educational bearings of biology in general *does* precede that of special zoology and botany, I am rejoiced to be able to take advantage of the light thus already thrown upon the tendency and methods of physiological science.

Regarding physiological science, then, in its widest sense—as the equivalent of *biology*—the

[1] An address delivered in St. Martin's Hall, London, July 22, 1854.

science of individual life—we have to consider in succession:

1. Its position and scope as a branch of knowledge.

2. Its value as a means of mental discipline.

3. Its worth as practical information.

And lastly,

4. At what period it may best be made a branch of education.

Our conclusions on the first of these heads must depend, of course, upon the nature of the subject-matter of biology; and I think a few preliminary considerations will place before you in a clear light the vast difference which exists between the living bodies with which physiological science is concerned, and the remainder of the universe; between the phenomena of number and space, of physical and of chemical force, on the one hand, and those of Life on the other.

The mathematician, the physicist, and the chemist contemplate things in a condition of rest; they look upon a state of equilibrium as that to which all bodies normally tend.

The mathematician does not suppose that a quantity will alter, or that a given point in space will change its direction with regard to another point, spontaneously. And it is the same with the physicist. When Newton saw the apple fall, he concluded at once that the act of falling was not

the result of any power inherent in the apple, but that it was the result of the action of something else on the apple. In a similar manner, all physical force is regarded as the disturbance of an equilibrium to which things tended before its exertion,—to which they will tend again after its cessation.

The chemist equally regards chemical change in a body, as the effect of the action of something external to the body changed. A chemical compound once formed would persist for ever, if no alteration took place in surrounding conditions.

But to the student of Life the aspect of Nature is reversed. Here, incessant, and, so far as we know, spontaneous change is the rule, rest the exception—the anomaly to be accounted for. Living things have no inertia, and tend to no equilibrium.

Permit me, however, to give more force and clearness to these somewhat abstract considerations, by an illustration or two.

Imagine a vessel full of water, at the ordinary temperature, in an atmosphere saturated with vapor. The *quantity* and the *figure* of that water will not change, so far as we know, for ever.

Suppose a lump of gold be thrown into the vessel—motion and disturbance of figure exactly proportional to the momentum of the gold will take place. But after a time the effects of this

disturbance will subside—equilibrium will be restored, and the water will return to its passive state.

Expose the water to cold—it will solidify—and in so doing its particles will arrange themselves in definite crystalline shapes. But once formed, these crystals change no further.

Again, substitute for the lump of gold some substance capable of entering into chemical relations with the water,—say, a mass of that substance which is called "protein," the substance of flesh,—a very considerable disturbance of equilibrium will take place—all sorts of chemical compositions and decompositions will occur; but in the end, as before, the result will be the resumption of a condition of rest.

Instead of such a mass of *dead* protein, however, take a particle of *living* protein—one of those minute microscopic living things which throng our pools, and are known as Infusoria—such a creature, for instance, as an Euglena, and place it in our vessel of water. It is a round mass provided with a long filament, and except in this peculiarity of shape, presents no appreciable physical or chemical difference whereby it might be distinguished from the particle of dead protein.

But the difference in the phenomena to which it will give rise is immense: in the first place it will develop a vast quantity of physical force—

cleaving the water in all directions with considerable rapidity by means of the vibrations of the long filament or cilium.

Nor is the amount of chemical energy which the little creature possesses less striking. It is a perfect laboratory in itself, and it will act and react upon the water and the matters contained therein; converting them into new compounds resembling its own substance, and at the same time giving up portions of its own substance which have become effete.

Furthermore, the Euglena will increase in size; but this increase is by no means unlimited, as the increase of a crystal might be. After it has grown to a certain extent it divides, and each portion assumes the form of the original, and proceeds to repeat the process of growth and division.

Nor is this all. For after a series of such divisions and subdivisions, these minute points assume a totally new form, lose their long tails—round themselves, and secrete a sort of envelope or box, in which they remain shut up for a time, eventually to resume, directly or indirectly, their primitive mode of existence.

Now, so far as we know, there is no natural limit to the existence of the Euglena, or of any other living germ. A living species once launched into existence tends to live for ever.

Consider how widely different this living particle

is from the dead atoms with which the physicist and chemist have to do!

The particle of gold falls to the bottom and rests; the particle of dead protein decomposes and disappears—it also rests: but the *living* protein mass neither tends to exhaustion of its forces nor to any permanency of form, but is essentially distinguished as a disturber of equilibrium so far as force is concerned,—as undergoing continual metamorphosis and change, in point of form.

Tendency to equilibrium of force and to permanency of form, then, are the characters of that portion of the universe which does not live—the domain of the chemist and physicist.

Tendency to disturb existing equilibrium—to take on forms which succeed one another in definite cycles—is the character of the living world.

What is the cause of this wonderful difference between the dead particle and the living particle of matter appearing in other respects identical? that difference to which we give the name of Life?

I, for one, cannot tell you. It may be that, by and by, philosophers will discover some higher laws of which the facts of life are particular cases —very possibly they will find out some bond between physico-chemical phenomena on the one hand, and vital phenomena on the other. At present, however, we assuredly know of none; and I

think we shall exercise a wise humility in confessing that, for us at least, this successive assumption of different states—(external conditions remaining the same)—this *spontaneity of action*—if I may use a term which implies more than I would be answerable for—which constitutes so vast and plain a practical distinction between living bodies and those which do not live, is an ultimate fact; indicating as such, the existence of a broad line of demarcation between the subject-matter of biological and that of all other sciences.

For I would have it understood that this simple Euglena is the type of *all* living things, so far as the distinction between these and inert matter is concerned. That cycle of changes, which is constituted by perhaps not more than two or three steps in the Euglena, is as clearly manifested in the multitudinous stages through which the germ of an oak or of a man passes. Whatever forms the Living Being may take on, whether simple or complex, *production*, *growth*, *reproduction*, are the phenomena which distinguish it from that which does not live.

If this be true, it is clear that the student, in passing from the physico-chemical to the physiological sciences, enters upon a totally new order of facts; and it will next be for us to consider how far these new facts involve *new* methods, or require a modification of those with which he is

already acquainted. Now a great deal is said about the peculiarity of the scientific method in general, and of the different methods which are pursued in the different sciences. The mathematics are said to have one special method; physics another, biology a third, and so forth. For my own part, I must confess that I do not understand this phraseology.

So far as I can arrive at any clear comprehension of the matter, Science is not, as many would seem to suppose, a modification of the black art, suited to the tastes of the nineteenth century, and flourishing mainly in consequence of the decay of the Inquisition.

Science is, I believe, nothing but *trained and organized common sense*, differing from the latter only as a veteran may differ from a raw recruit: and its methods differ from those of common sense only so far as the guardsman's cut and thrust differ from the manner in which a savage wields his club. The primary power is the same in each case, and perhaps the untutored savage has the more brawny arm of the two. The *real* advantage lies in the point and polish of the swordsman's weapon; in the trained eye quick to spy out the weakness of the adversary; in the ready hand prompt to follow it on the instant. But, after all, the sword exercise is only the hewing and poking of the clubman developed and perfected.

So, the vast results obtained by Science are won by no mystical faculties, by no mental processes, other than those which are practised by every one of us, in the humblest and meanest affairs of life. A detective policeman discovers a burglar from the marks made by his shoe, by a mental process identical with that by which Cuvier restored the extinct animals of Montmartre from fragments of their bones.[1] Nor does that process of induction and deduction by which a lady, finding a stain of a peculiar kind upon her dress, concludes that somebody has upset the inkstand thereon, differ in any way, in kind, from that by which Adams and Leverrier discovered a new planet.[2]

The man of science, in fact, simply uses with scrupulous exactness, the methods which we all, habitually and at every moment, use carelessly; and the man of business must as much avail himself of the scientific method—must be as truly a man of science—as the veriest bookworm of us all; though I have no doubt that the man of business will find himself out to be a philosopher with as much surprise as M. Jourdain exhibited, when he discovered that he had been all his life talking

[1] Montmartre, a quarter in the city of Paris. Excavations here made brought to light numerous fossils.

[2] John Couch Adams (1819–1892) and Urbain Jean Joseph Leverrier (1811–1877), working independently, discovered the planet Neptune at about the same time.

prose.[1] If, however, there be no real difference between the methods of science and those of common life, it would seem, on the face of the matter, highly improbable that there should be any difference between the methods of the different sciences; nevertheless, it is constantly taken for granted, that there is a very wide difference between the physiological and other sciences in point of method.

In the first place it is said—and I take this point first, because the imputation is too frequently admitted by physiologists themselves—that biology differs from the physico-chemical and mathematical sciences in being "inexact."

Now, this phrase "inexact" must refer either to the *methods* or to the *results* of physiological science.

It cannot be correct to apply it to the methods; for, as I hope to show you by and by, these are identical in all sciences, and whatever is true of physiological method is true of physical and mathematical method.

Is it then the *results* of biological science which are "inexact"? I think not. If I say that respiration is performed by the lungs; that digestion is effected in the stomach; that the eye is the

[1] Monsieur Jourdain is the hero of Molière's comedy *Le Bourgeois Gentilhomme*. The incident here mentioned has become proverbial.

organ of sight; that the jaws of a vertebrated animal never open sideways, but always up and down; while those of an annulose animal always open sideways, and never up and down—I am enumerating propositions which are as exact as anything in Euclid. How then has this notion of the inexactness of biological science come about? I believe from two causes: first, because, in consequence of the great complexity of the science and the multitude of interfering conditions, we are very often only enabled to predict approximately what will occur under given circumstances; and secondly, because, on account of the comparative youth of the physiological sciences, a great many of their laws are still imperfectly worked out. But, in an educational point of view, it is most important to distinguish between the essence of a science and the accidents which surround it; and essentially, the methods and results of physiology are as exact as those of physics or mathematics.

It is said that the physiological method is especially *comparative;* and this dictum also finds favor in the eyes of many. I should be sorry to suggest that the speculators on scientific classification have been misled by the accident of the name of one leading branch of biology—*comparative anatomy;* but I would ask whether *comparison,* and that classification which is the result

of comparison, are not the essence of every science whatsoever? How is it possible to discover a relation of cause and effect of *any* kind without comparing a series of cases together in which the supposed cause and effect occur singly, or combined? So far from comparison being in any way peculiar to biological science, it is, I think, the essence of every science.

A speculative philosopher[1] again tells us that the biological sciences are distinguished by being sciences of observation and not of experiment!

Of all the strange assertions into which speculation without practical acquaintance with a subject may lead even an able man, I think this is the very strangest. Physiology not an experimental science! Why, there is not a function of a single organ in the body which has not been determined wholly and solely by experiment. How did Harvey determine the nature of the circulation, except by experiment? How did Sir Charles Bell determine the functions of the roots of the spinal nerves, save by experiment? How do we know the use of a nerve at all, except by experiment? Nay, how do you know even that your eye is your seeing apparatus, unless you make the experiment of shutting it; or that your ear is your hearing apparatus, unless you close it up and thereby discover that you become deaf?

[1] Auguste Comte (1798–1857), a French philosopher.

It would really be much more true to say that physiology is *the* experimental science *par excellence* of all sciences; that in which there is least to be learnt by mere observation, and that which affords the greatest field for the exercise of those faculties which characterize the experimental philosopher. I confess, if any one were to ask me for a model application of the logic of experiment, I should know no better work to put into his hands than Bernard's late *Researches on the Functions of the Liver.*[1]

Not to give this lecture a too controversial tone, however, I must only advert to one more doctrine, held by a thinker of our own age and country,[2] whose opinions are worthy of all respect. It is, that the biological sciences differ from all others, inasmuch as in *them* classification takes place by type and not by definition.

It is said, in short, that a natural-history class is not capable of being defined—that the class Rosaceæ, for instance, or the class of Fishes, is not accurately and absolutely definable, inasmuch as its members will present exceptions to every possible definition; and that the members of the class are united together only by the circumstance that they are all more like some imaginary average

[1] Claude Bernard (1813–1878), a French physiologist.

[2] William Whewell (1794–1866), an English philosopher and scholar.

rose or average fish, than they resemble anything else.

But here, as before, I think the distinction has arisen entirely from confusing a transitory imperfection with an essential character. So long as our information concerning them is imperfect, we class all objects together according to resemblances which we *feel*, but cannot *define;* we group them round *types*, in short. Thus, if you ask an ordinary person what kinds of animals there are, he will probably say beasts, birds, reptiles, fishes, insects, etc. Ask him to define a beast from a reptile, and he cannot do it; but he says, things like a cow or a horse are beasts, and things like a frog or a lizard are reptiles. You see *he does* class by type, and not by definition. But how does this classification differ from that of the scientific zoologist? How does the meaning of the scientific class-name of "Mammalia" differ from the unscientific of "Beasts"?

Why, exactly because the former depends on a definition, the latter on a type. The class Mammalia is scientifically defined as "all animals which have a vertebrated skeleton and suckle their young." Here is no reference to type, but a definition rigorous enough for a geometrician. And such is the character which every scientific naturalist recognizes as that to which his classes must aspire—knowing, as he does, that classification by

type is simply an acknowledgment of ignorance and a temporary device.

So much in the way of negative argument as against the reputed differences between biological and other methods. No such differences, I believe, really exist. The subject-matter of biological science is different from that of other sciences, but the methods of all are identical; and these methods are—

1. *Observation* of facts—including under this head that *artificial observation* which is called *experiment.*

2. That process of tying up similar facts into bundles, ticketed and ready for use, which is called *comparison* and *classification,*—the results of the process, the ticketed bundles, being named *general propositions.*

3. *Deduction,* which takes us from the general proposition to facts again—teaches us, if I may so say, to anticipate from the ticket what is inside the bundle. And finally—

4. *Verification,* which is the process of ascertaining whether, in point of fact, our anticipation is a correct one.

Such are the methods of all science whatsoever; but perhaps you will permit me to give you an illustration of their employment in the science of Life; and I will take as a special case the estab-

lishment of the doctrine of the *circulation of the blood.*

In this case, *simple observation* yields us a knowledge of the existence of the blood from some accidental hemorrhage, we will say: we may even grant that it informs us of the localization of this blood in particular vessels, the heart, etc., from some accidental cut or the like. It teaches also the existence of a pulse in various parts of the body, and acquaints us with the structure of the heart and vessels.

Here, however, *simple observation* stops, and we must have recourse to *experiment.*

You tie a vein, and you find that the blood accumulates on the side of the ligature opposite the heart. You tie an artery, and you find that the blood accumulates on the side near the heart. Open the chest, and you see the heart contracting with great force. Make openings into its principal cavities, and you will find that all the blood flows out, and no more pressure is exerted on either side of the arterial or venous ligature.

Now all these facts, taken together, constitute the evidence that the blood is propelled by the heart through the arteries, and returns by the veins—that, in short, the blood circulates.

Suppose our experiments and observations have been made on horses, then we group and ticket

them into a general proposition, thus: *all horses have a circulation of their blood.*

Henceforward a horse is a sort of indication or label, telling us where we shall find a peculiar series of phenomena called the circulation of the blood.

Here is our *general proposition*, then.

How, and when, are we justified in making our next step—a *deduction* from it?

Suppose our physiologist, whose experience is limited to horses, meets with a zebra for the first time,—will he suppose that this generalization holds good for zebras also?

That depends very much on his turn of mind. But we will suppose him to be a bold man. He will say, "The zebra is certainly not a horse, but it is very like one,—so like, that it must be the 'ticket' or mark of a blood-circulation also; and I conclude that the zebra has a circulation."

That is a deduction, a very fair deduction, but by no means to be considered scientifically secure. This last quality, in fact, can only be given by *verification*—that is, by making a zebra the subject of all the experiments performed on the horse. Of course, in the present case, the *deduction* would be *confirmed* by this process of verification, and the result would be, not merely a positive widening of knowledge, but a fair increase of confidence in the truth of one's generalizations in other cases.

Thus, having settled the point in the zebra and horse, our philosopher would have great confidence in the existence of a circulation in the ass. Nay, I fancy most persons would excuse him, if in this case he did not take the trouble to go through the process of verification at all; and it would not be without a parallel in the history of the human mind, if our imaginary physiologist now maintained that he was acquainted with asinine circulation *à priori*.

However, if I might impress any caution upon your minds, it is, the utterly conditional nature of all our knowledge,—the danger of neglecting the process of verification under any circumstances; and the film upon which we rest, the moment our deductions carry us beyond the reach of this great process of verification. There is no better instance of this than is afforded by the history of our knowledge of the circulation of the blood in the animal kingdom until the year 1824. In every animal possessing a circulation at all, which had been observed up to that time, the current of the blood was known to take one definite and invariable direction. Now, there is a class of animals called *Ascidians*, which possess a heart and a circulation, and up to the period of which I speak, no one would have dreamt of questioning the propriety of the deduction, that these crea-

tures have a circulation in one direction; nor would any one have thought it worth while to verify the point. But, in that year, M. von Hasselt, happening to examine a transparent animal of this class, found, to his infinite surprise, that after the heart had beat a certain number of times, it stopped, and then began beating the opposite way—so as to reverse the course of the current, which returned by and by to its original direction.

I have myself timed the heart of these little animals. I found it as regular as possible in its periods of reversal: and I know no spectacle in the animal kingdom more wonderful than that which it presents—all the more wonderful that to this day it remains an unique fact, peculiar to this class among the whole animated world. At the same time I know of no more striking case of the necessity of the *verification* of even those deductions which seem founded on the widest and safest inductions.

Such are the methods of biology—methods which are obviously identical with those of all other sciences, and therefore wholly incompetent to form the ground of any distinction between it and them.[1]

[1] Save for the pleasure of doing so, I need hardly point out my obligations to Mr. J. S. Mill's *System of Logic*, in this view of scientific method. [Author's note.]

But I shall be asked at once, Do you mean to say that there is no difference between the habit of mind of a mathematician and that of a naturalist? Do you imagine that Laplace might have been put into the Jardin des Plantes,[1] and Cuvier into the Observatory, with equal advantage to the progress of the sciences they professed?

To which I would reply, that nothing could be further from my thoughts. But different habits and various special tendencies of two sciences do not imply different methods. The mountaineer and the man of the plains have very different habits of progression, and each would be at a loss in the other's place; but the method of progression, by putting one leg before the other, is the same in each case. Every step of each is a combination of a lift and a push; but the mountaineer lifts more and the lowlander pushes more. And I think the case of two sciences resembles this.

I do not question for a moment that while the mathematician is busied with deductions *from* general propositions, the biologist is more especially occupied with observation, comparison, and those processes which lead *to* general propositions. All I wish to insist upon is, that this difference depends not on any fundamental distinction in the sciences themselves, but on the accidents of their

[1] The Botanical Gardens.

subject-matter, of their relative complexity, and consequent relative perfection.

The mathematician deals with two properties of objects only, number and extension, and all the inductions he wants have been formed and finished ages ago. He is occupied now with nothing but deduction and verification.

The biologist deals with a vast number of properties of objects, and his inductions will not be completed, I fear, for ages to come; but when they are, his science will be as deductive and as exact as the mathematics themselves.

Such is the relation of biology to those sciences which deal with objects having fewer properties than itself. But as the student, in reaching biology, looks back upon sciences of a less complex and therefore more perfect nature; so, on the other hand, does he look forward to other more complex and less perfect branches of knowledge. Biology deals only with living beings as isolated things—treats only of the life of the individual: but there is a higher division of science still, which considers living beings as aggregates—which deals with the relation of living beings one to another—the science which *observes* men—whose *experiments* are made by nations one upon another, in battle-fields—whose *general propositions* are embodied in history, morality, and religion—whose *deductions*

lead to our happiness or our misery,—and whose *verifications* so often come too late, and serve only

To point a moral or adorn a tale—

I mean the science of Society or *Sociology*.

I think it is one of the grandest features of biology that it occupies this central position in human knowledge. There is no side of the human mind which physiological study leaves uncultivated. Connected by innumerable ties with abstract science, physiology is yet in the most intimate relation with humanity; and by teaching us that law and order, and a definite scheme of development, regulate even the strangest and wildest manifestations of individual life, she prepares the student to look for a goal even amidst the erratic wanderings of mankind, and to believe that history offers something more than an entertaining chaos—a journal of a toilsome, tragi-comic march nowhither.

The preceding considerations have, I hope, served to indicate the replies which befit the two first of the questions which I set before you at starting, viz., What is the range and position of physiological science as a branch of knowledge? and What is its value as a means of mental discipline?

Its *subject-matter* is a large moiety of the universe—its *position* is midway between the physico-

chemical and the social sciences. Its *value* as a branch of discipline is partly that which it has in common with all sciences—the training and strengthening of common sense; partly that which is more peculiar to itself—the great exercise which it affords to the faculties of observation and comparison; and I may add, the *exactness* of knowledge which it requires on the part of those among its votaries who desire to extend its boundaries.

If what has been said as to the position and scope of biology be correct, our third question—What is the practical value of physiological instruction?—might, one would think, be left to answer itself.

On other grounds even, were mankind deserving of the title "rational," which they arrogate to themselves, there can be no question that they would consider, as the most necessary of all branches of instruction for themselves and for their children, that which professes to acquaint them with the conditions of the existence they prize so highly—which teaches them how to avoid disease and to cherish health, in themselves and those who are dear to them.

I am addressing, I imagine, an audience of educated persons; and yet I dare venture to assert that, with the exception of those of my hearers who may chance to have received a medical education, there is not one who could tell me what

is the meaning and use of an act which he performs a score of times every minute, and whose suspension would involve his immediate death,—I mean the act of breathing,—or who could state in precise terms why it is that a confined atmosphere is injurious to health.

The *practical value* of physiological knowledge! Why is it that educated men can be found to maintain that a slaughter-house in the midst of a great city is rather a good thing than otherwise?—that mothers persist in exposing the largest possible amount of surface of their children to the cold, by the absurd style of dress they adopt, and then marvel at the peculiar dispensation of Providence, which removes their infants by bronchitis and gastric fever? Why is it that quackery rides rampant over the land; and that not long ago, one of the largest public rooms in this great city could be filled by an audience gravely listening to the reverend expositor of the doctrine that the simple physiological phenomena known as spirit-rapping, table-turning, phreno-magnetism, and by I know not what other absurd and inappropriate names, are due to the direct and personal agency of Satan?

Why is all this, except from the utter ignorance as to the simplest laws of their own animal life, which prevails among even the most highly educated persons in this country?

But there are other branches of biological science, besides physiology proper, whose practical influence, though less obvious, is not, as I believe, less certain. I have heard educated men speak with an ill-disguised contempt of the studies of the naturalist, and ask, not without a shrug, "What is the use of knowing all about these miserable animals—what bearing has it on human life?"

I will endeavor to answer that question. I take it that all will admit there is definite government of this universe—that its pleasures and pains are not scattered at random, but are distributed in accordance with orderly and fixed laws, and that it is only in accordance with all we know of the rest of the world, that there should be an agreement between one portion of the sensitive creation and another in these matters.

Surely then it interests us to know the lot of other animal creatures—however far below us, they are still the sole created things which share with us the capability of pleasure and the susceptibility to pain.

I cannot but think that he who finds a certain proportion of pain and evil inseparably woven up in the life of the very worms, will bear his own share with more courage and submission; and will, at any rate, view with suspicion those weakly amiable theories of the Divine government, which

would have us believe pain to be an oversight and a mistake,—to be corrected by and by. On the other hand, the predominance of happiness among living things—their lavish beauty—the secret and wonderful harmony which pervades them all, from the highest to the lowest, are equally striking refutations of that modern Manichean doctrine, which exhibits the world as a slave-mill, worked with many tears, for mere utilitarian ends.[1]

There is yet another way in which natural history may, I am convinced, take a profound hold upon practical life,—and that is, by its influence over our finer feelings, as the greatest of all sources of that pleasure which is derivable from beauty. I do not pretend that natural-history knowledge, as such, can increase our sense of the beautiful in natural objects. I do not suppose that the dead soul of Peter Bell, of whom the great poet of nature says,—

> A primrose by the river's brim,
> A yellow primrose was to him,—
> And it was nothing more,[2]—

would have been a whit roused from its apathy, by the information that the primrose is a Dicotyledonous Exogen, with a monopetalous corolla and

[1] The doctrine taught by Manichæus, a Persian of the third century, A.D., was extremely ascetic.

[2] Wordsworth's *Peter Bell.*

central placentation. But I advocate natural-history knowledge from this point of view, because it would lead us to *seek* the beauties of natural objects, instead of trusting to chance to force them on our attention. To a person uninstructed in natural history, his country or sea-side stroll is a walk through a gallery filled with wonderful works of art, nine-tenths of which have their faces turned to the wall. Teach him something of natural history, and you place in his hands a catalogue of those which are worth turning round. Surely our innocent pleasures are not so abundant in this life, that we can afford to despise this or any other source of them. We should fear being banished for our neglect to that limbo, where the great Florentine tells us are those who, during this life, "wept when they might be joyful." [1]

But I shall be trespassing unwarrantably on your kindness, if I do not proceed at once to my last point—the time at which physiological science should first form a part of the curriculum of education.

The distinction between the teaching of the facts of a science as instruction, and the teaching it systematically as knowledge, has already been placed before you in a previous lecture: and it appears to me that, as with other sciences, the *common facts* of biology—the uses of parts of the

[1] The allusion is to Canto VII of Dante's *Inferno*.

body—the names and habits of the living creatures which surround us—may be taught with advantage to the youngest child. Indeed, the avidity of children for this kind of knowledge, and the comparative ease with which they retain it, is something quite marvellous. I doubt whether any toy would be so acceptable to young children as a vivarium of the same kind as, but of course on a smaller scale than, those admirable devices in the Zoological Gardens.

On the other hand, systematic teaching in biology cannot be attempted with success until the student has attained to a certain knowledge of physics and chemistry: for though the phenomena of life are dependent neither on physical nor on chemical, but on vital forces, yet they result in all sorts of physical and chemical changes, which can only be judged by their own laws.

And now to sum up in a few words the conclusions to which I hope you see reason to follow me.

Biology needs no apologist when she demands a place—and a prominent place—in any scheme of education worthy of the name. Leave out the physiological sciences from your curriculum, and you launch the student into the world, undisciplined in that science whose subject-matter would best develop his powers of observation; ignorant of facts of the deepest importance for his own and others' welfare; blind to the richest sources of

beauty in God's creation; and unprovided with that belief in a living law, and an order manifesting itself in and through endless change and variety, which might serve to check and moderate that phase of despair through which, if he take an earnest interest in social problems, he will assuredly sooner or later pass.

Finally, one word for myself. I have not hesitated to speak strongly where I have felt strongly; and I am but too conscious that the indicative and imperative moods have too often taken the place of the more becoming subjunctive and conditional. I feel, therefore, how necessary it is to beg you to forget the personality of him who has thus ventured to address you, and to consider only the truth or error in what has been said.

A CHANGE OF EDUCATIONAL EMPHASIS[1]

EDWARD ASAHEL BIRGE

No part of our educational system occasions such searchings of heart or shakings of head as does the college. Everywhere else in the field of education we have evidence of healthy growth, of vigorous life. The high school not many years ago maintained an apologetic attitude toward a public which grudgingly supported it, but now asserts itself as "the people's college." The graduate school, with its work of research, hardly known, even by name, a generation ago, is to-day established, not only as part of our universities, but also as part of the scheme of public education. The schools of medicine and law have doubled and trebled their demands upon the student who seeks entrance to the professions whose doors they guard. It seems to some of the less hopeful members of our college faculties that, amid these growing and spreading institutions, the college course

[1] Reprinted from *The Atlantic Monthly* through the generous permission of the Houghton Mifflin Company.

is likely to be crowded and starved out of existence. From below, the high school has threatened to absorb a year or two of its time. Graduate and professional schools have reached down to snatch away its students from the last year, or even two years, of the course.

The college teacher has lived between these forces, in dread of losing his field of labor; fearing that when, like all Gaul, his domain was divided into three parts between high school, professional, and graduate schools, there would be as little left for his control as was left to the Gauls when Cæsar was through with them. Still more, he has felt that the temper of college studies and the nature of college students have altered and—he may be pardoned for thinking—have worsened greatly. New studies have entered the college; many of them technical and alien to the old college course. A new type of student has come, especially alien, seeking and expecting practical results rather than culture. And since all of these changes, present and threatened, have come upon him with bewildering rapidity, it is not surprising if he sometimes feels that the very life of the college is in danger. I do not share his apprehensions, believing that the college has a tough and enduring vitality. These changes, whose significance and importance I would not underrate, seem to me to have been the result of a natural

evolution, which has thrown the emphasis of college activities and college teaching upon the intellectual rather than the ethical side of life.

Let me draw a little from my own college experience and observation, in order to characterize this change of temper a little more clearly. Forty years ago, I entered college—a small Eastern college, whose freshman class is now far larger than was the college of my day. I cannot boast that we, the "few but fit," who were freshmen in 1869 were intellectual prodigies, of even or exceptionally distinguished excellence. The records of my class and college mates show that they have taken an honorable part in the world's work, but one not greatly different from that taken by college students of any period before or since. But we had at least one merit, or demerit, as contrasted with the freshmen of to-day. We did not come to college seeking studies which would directly prepare us for our future career. We entered on a four years' college course with no such definite plan. We came not merely for the sake of the knowledge which we might get from our studies; still less to secure a practical training for life; but for the sake of somewhat vague and intangible intellectual gains. We were in search, too, of that still less tangible thing, culture, as we found out later when Matthew Arnold taught us to use the word.

For the American college of that day was still in that condition which it maintained for a great part of the nineteenth century, and which one may call beatific, or the reverse, according to his point of view. In still older times it had been a professional school, founded to train godly youth for the Christian ministry, and its curriculum and its methods had carried out the intention of pious founders and equally pious faculties. As time had passed it had lost its professional purposes, but had retained its intellectual qualities and its ethical tendencies. During much of the nineteenth century the college expressed its own character, and wrought out its own purposes, with a freedom and independence which it never enjoyed before or since. Ecclesiastical control was a thing of the past, as was also the adjustment of teaching to the needs of the ministry. The correlation of college work with the practical demands of society was yet in the future. The college offered a simple, homogeneous course of study, so simple and homogeneous that its ends and purposes could be clearly seen and definitely sought. The college selected carefully those who should become the students in this course. The nature of the programme of education which it offered kept from its halls all but those who thought themselves in sympathy with its purposes; and that it might winnow still more perfectly those seekers for

learning, the college established and enforced narrow and rigid terms of admission.

In 1869 the course of study remained but little changed from that of the old time; for the new learning, which forty years ago was the learning of science, had barely reached the college. Science in name was there indeed, but not in spirit. Recitations and illustrative lectures constituted all the instruction in physics and chemistry which we received from men who later and elsewhere became the heads of great laboratories. Of laboratory work we had none. Our college indeed had laboratories, but they existed for the professor alone; and we used to wonder what the professor did in them; for I suppose that no other laboratories for physics and chemistry ever enjoyed such a situation as did these, which had a gymnasium above them and a bowling-alley beneath.

The case of the "new humanities" was still worse than that of science. We never heard of "sources" in history or in literature. We prepared our lesson from the text-book, recited and discussed it, and let the evil of the day suffice to itself without further question or debate. Elective studies offered us no problem worthy of the name. We might choose between one year of French and one of German. Otherwise, we all met in the same classes. We accepted the intellectual fare that the college set before us, asking no ques-

tions for conscience' or any other sake. Latin, Greek, mathematics, and philosophy, all taught in a way now called "old-fashioned," were still the backbone of our course, which lacked almost wholly the things which the undergraduate values in the college of to-day.

But simple and impoverished as such a course of study must seem to the present generation of students, I question whether those of us who were exercised thereby would greatly wish to exchange it for the far richer programme of the present time. For the limitations of the college of our day, which we recognize as freely as any one, were in some sense of the nature of virtues to the youth who sought it. We came to it with no delusions as to what the college would give us. We did not suppose that Livy and Demosthenes, calculus and natural theology, or any combination of these studies, would be of "practical value" to us in later life. We knew that the life of the college was dissociated from the life to follow it; that it led directly to no calling, to no profession. This was one reason for our going to college. We took four years of our youth and devoted them, quite unconsciously, to the intellectual life and to the ethical spirit. We accepted that life as we found it in the college; not, indeed, without grumbling,—the immemorial and dearest privilege of the undergraduate,—but without thought of altering its

conditions, and at bottom without seriously desiring to do so. The absence of electives was by no means an unmixed ill. It was not our duty to forecast our future lives and to imagine the result upon them of selecting this study or that; for all studies were equally removed from any profession except that of a teacher, and in no case was there opportunity for choice.

This freedom from responsibility was, no doubt, a loss to us on one side, but in other directions it was no small gain. We were free from a host of considerations alien to the work of the college. Our minds and hearts during our college lives were within the college walls, and we were the more readily subject to the influences of the place. If the methods of teaching history, English, and science were imperfect, there were compensating advantages. At least, we had no assigned collateral reading, nor required notes, and literature came to us in the form of pleasure rather than of work. If we had no laboratory courses, we had at least the time which the laboratory would have demanded. When the day's lessons had been prepared, we still had leisure to waste or to improve at will. As I look back, I feel that many hours of my college life, wasted on ineffective work for natural history collections, in loitering in the remoter alcoves of the library, in turning over old and forgotten books, have in time yielded me a far

larger harvest than much of my serious work. I have found that the intellectual fun of college life has given me quite as much as its labors.

Thus we sought and we gained, both from work and from play, each according to his desires and his capacity, an entrance to the intellectual life. We acquired, most of us without becoming conscious of the fact, the rudiments of a liberal education—the education of a free man in a free state; the education which, preparing him for no particular calling, fits him for a life of freedom. We caught a glimpse of the liberating truth; of that wisdom which makes one not wholly alien or ill at ease in the silent society of the leaders of the thought and life of all ages, nor out of place in the company of those whose lives to-day are guided by the wisdom of the past and inspired by the vision of the future.

The life of the college a generation ago was, then, a spiritual life, freed from all considerations both of professionalism and of practicality. Devoid of all direct relations to the life which was to follow, it was free to work out its own ideas as it never had been before, and as it is not now. The intellectual life, lived in an ethical spirit: this was central to the college a generation ago, and a youth could do far worse than spend four years in close contact with that spirit. Do I too greatly exalt the life which I shared for four years? I

think not, for its defects are clearly before me as I write. I recognize that much of its teaching was such as would not be tolerated to-day in any college of high rank. I see clearly enough its narrowness, its absurdities. When I think of the use, or rather non-use, to which it put the scientific abilities of its faculty, I must both smile at the situation and grieve at our losses. Yet if I idealize it in spite of these faults, in spite of years spent in helping to build up a college of another type, is not this fact itself the strongest evidence that I can give of the power of that life and of the quality of its spiritual character?

But what sort of education came from a course of study thus conceived and thus carried out? What preparation for modern life could the student get from a course that offered practically no science, no history, and small German and French? Without electives, how could it be adapted to varying tastes and necessities? Can we call such a course of study adequate, or can we fairly name it a liberal education?

Shall we agree to test this old-fashioned course by Milton's still older definition of a liberal education? To my thought, two and a half centuries have neither mended nor bettered his conception. "I call, therefore," he said, "a complete and generous education that which enables a man to perform justly, skillfully, and magnanimously all of

the offices, public and private, both of peace and war." Let us try our college course by each of Milton's words severally. Can we say that it enabled us to perform "skillfully" the offices of life? I can hardly claim this virtue for it and yet say, as I do, that the course of study was detached from life. Assuredly, we must mark it very low as rated by this test.

"Justly"—the word gives us longer pause, and we must consider what it is to perform justly the offices of society. If we mean accurately, construing justice in the strict and narrow sense, I fear that our college of a generation ago must be ranked low in this respect also. Its course of study afforded no adequate basis for an accurate weighing of competing claims, of conflicting duties, or of clashing interests. But construe the word more broadly, and we shall rate the college much higher. Is the sense of just proportion cultivated by that course of study which, during four years, attempts to make the soul sensitive to those forces of the invisible world whose presence is not readily felt in the hurry and bustle of life? Is justice disclosed in a nice weighing of claims which stand on the same basis, or in the power to set over against the mass of the things of the visible world those things which, being not seen, are eternal? May not those most wisely adjust the claims of conduct who have not indeed been

taught very much about its rules and methods, but who have spent four years amid high thoughts and in worthy company and with worthy examples? If we assent to this view, then must we admit that the old-fashioned college course highly fulfilled this part of Milton's conception.

But "magnanimously"—what shall we say to this term, which so triumphantly closes Milton's triad of qualities, whose sound in the ear is worthy of the "mighty-mouthed inventor of harmonies," and whose sense awakens the soul to surprise and delight? What did Milton mean by "magnanimously"? He might well accept that definition which Bacon had given to the word a generation earlier: "Magnanimity no doubt consisteth in contempt of peril, in contempt of profit, and in the meriting of the times wherein one liveth." These are lofty terms, and we graduates may well shrink from testing our lives by them, lest, as in Bacon's case, the wide difference between teaching and practice appear too plainly. Yet as I look around me at the college men of my generation and see their work for their times, I can but feel that their alma mater showed them somewhat of this magnanimity. Can we older men stand, each in the forum of his own conscience, and claim that here I acted in contempt of peril, there I rejected profit, and in this respect I have done somewhat to better my times?

If we can do this, do we not feel that in this we were but worthy children of alma mater?

Wherever we must in justice pronounce that our actions have lacked her magnanimity, do we not feel it as at once our deepest condemnation and our bitterest regret that we have fallen away from her spirit and her wide view of life? However weak we ourselves may have been in the face of moral danger, we are sure that alma mater lived "in contempt of peril." However heavy the dollar may have weighed in the scales of our motives, she at least lived "in contempt of profit." However pitiful the remainder of benefit which the world receives from our lives, hers was unselfishly devoted to "meriting the times wherein she lived."

When the college of a generation ago planned the training for the offices of life which its students should receive, it set little store by skill. It supposed that the graduate would acquire this in later life, in the natural order of events, and as a matter of course. It expected its graduates to live justly, rather because of a quickened moral sense than from a trained and discriminating judgment. The emphasis of its reading of Milton's definition was placed on the word "magnanimously." Out of the three terms which define a liberal education, this was the one which the Lord had given to the college; not indeed to be in its mouth, but in its heart; and therefore the col-

lege of forty years ago furnished its students with the rudiments of a liberal education. This it did in spite of a limited programme of studies, in spite of narrow views of education, of inadequate resources, of methods already antiquated. It succeeded in spite of these and other defects, and in some sense by means of them. It succeeded because it was able to inspire its alumni with some portion of its own intellectual sympathies, of its ethical purposes, of its spiritual temper.

But a generation which has changed all things educational has not spared the college, and in the early seventies it stood on the brink of great and radical alterations, already foreshadowed in its actual conditions. First among the influences which have wrought these changes, I should place the enlargement of the curriculum; then, the introduction of research; and, third, the increase in the number of students. All these forces have acted and reacted upon one another in most complex fashion, but all have tended to the same general results. They have increased the emphasis on the intellectual rather than on the moral elements of a liberal education, and have made the college definitely and avowedly a preparatory school for life.

Consider the effect of the first of these forces: the enlargement of the curriculum. The begin-

nings of this movement go far back beyond the days of which I speak. In 1870 the larger universities already had numerous elective courses of study. Modern languages had long been taught, though none of them yet dared claim a place beside the classics. Science had become a necessary part of technical courses, and university laboratories for chemistry and physics, and even for biological science, were by no means unknown. But the college world as a whole knew little of modern language or of science. For the student of forty years ago a college education still meant classics, mathematics, and philosophy. Yet the college was about to discover science and to learn something of the scientific method, and of its possibilities as an educational instrument.

In the world outside, there was raging the storm of scientific controversy, very little of whose violence—astonishingly little—penetrated into the quiet retreat of the college. But the contest over Darwinism meant that men were thinking about science with an intensity, and to an extent, never before known in human history, and which will probably never be known again. Science thus won without the college the right to full recognition within it. It was no longer to be recited, to be lectured about in brief courses for general information and as a relief from severer studies. It demanded full and equal admission to the college

course; and but a few years were to pass before that demand was granted and every college had its laboratories for all the fundamental sciences.

The college world was committed, not only to teach about science, but to that vastly different and harder thing, to teach science. Important changes followed this enlargement of the curriculum. The new laboratory courses demanded numerous teachers, and thus were introduced into faculties new men, trained by other methods than those of the old college, who brought with them a new temper and new ideals. Laboratory courses demanded time. Science teachers asked for their departments, not a secondary, but a co-ordinate place in the curriculum. Thus arose the necessity for still further changes. The old scheme of studies no longer fitted the new conditions, and the full acceptance of the elective system in some form became a mere necessity. This was a radical innovation in the college course, and one which altered both the nature of the course and the attitude of the student toward it and toward his work.

The multiplication of courses did not stop with the sciences. The modern languages began to assert their rights as disciplinary studies, and to take position alongside of the older courses in the ancient languages. When, in the eighties and nineties, men turned their thoughts from science and its message regarding man's origin, to ques-

tions of government, to social and economic problems, they sought the answers from history, from economics, from political science, and sociology. They sought answers which the general and elementary courses of the college could not give, and the college was forced to widen the scope of its curriculum. Thus the mere necessity of responding to the movement and development of public thought forced upon the colleges a reorganization of their courses of study—a revolution which has resulted in completely changing the intellectual balance of power in the faculty, and which has altered at every point the temper of the student's life.

But a change even more fundamental was at hand. No event in modern higher education in the United States is more significant than the foundation of Johns Hopkins University in 1876. With this event, research, and training for research, made their official entrance into American college life. I do not mean to say that these were unknown before that date. Higher degrees were well known, and graduate study, and even graduate schools had been established. But all these were still more or less incidental and accessory. They had not been a necessary part of the earlier college. Its professors were indeed supposed to be learned in the lore of their professions. They must be able to teach the known, but it was by

no means necessary that they should have either the taste or the ability to seek the unknown. Neither the college nor the professor included research within the sphere of duty. But the advent of Johns Hopkins University changed all this. Research became fundamental, and training for research an indispensable factor in the equipment of the college professor.

If the enlargement of the curriculum introduced new types of men into college faculties, and if the result of the elective system changed the attitude of the student toward his work, this introduction of research far more fundamentally altered the spirit of the faculty toward its duties. As the new men, trained in the new method, assumed control of college teaching, it became plain that nothing short of a revolution had occurred. The temper of the new men differed from that of their predecessors. They were drawn to their profession by a different complex of motives. The excellences of the best men were widely various under the two systems, and the defects of the failures were quite as different.

It cannot be too clearly seen that the old college course concerned itself primarily with conduct, with that conduct which we students practiced without knowing it, until Arnold defined it and told us that it was nine-tenths of life. The spirit of research seeks the things of the mind for their

own sake. Here is the first and fundamental distinction, and one that involved far-reaching consequences. For both student and teacher the subject became central where once the man was placed. The enlargement of knowledge came first rather than the development of character. The older college placed before its students a careful selection of "the best things said and thought," and asked them to remain for four years, to study these things and to gain from them a criticism of life. I do not mean that the college was so stupid as to put this purpose before its students in this way, but this was what it really did; and, so doing, it held its students within the area of the known, as near as might be to the spiritual centre of the known.

But the new temper of research was unhappy in this region. It was restless until it had escaped from the pleasant parks and well-ordered gardens, where learning had loved to stay. It sought the wilderness of the unknown that it might add it to the known. Thus great additions were made to the realm of knowledge—a rough, uncultivated country, or half-cultivated at best, devoid of pleasure to those trained in the old learning. Research rapidly charted it, annexed large areas, and called on its students to follow and complete the occupation of the land. They heard the call; they responded to it; and each, as he entered the coun-

try, found duties suited to his nature. Here was still the great unknown world beyond the border, irresistibly attracting the explorer; here were the pleasures, as well as the hardships, of the pioneer. Here, for the vast majority, was that unadventurous and far less inspiring labor by which the former frontier is, through toil and time, converted into the home of civilization.

Thus a new type of teacher was developed. The old professor had become one because he wanted to teach. At the best, he became a master of men, rather than a master of his subject. Look at the great teachers of philosophy in American colleges during the nineteenth century. How much attention does the philosophical world of to-day give to their contributions to their department? Hopkins and McCosh, Hickok and Porter —their works do not lie to-day on the table of the philosophical student. These men were teachers; to the problems of life as young men conceived them, they applied the fundamental ideas of philosophy as they conceived it. In human life, enriched and ennobled, in a pervasive social influence, exercised by them and their students, they had and have their high reward; not in their contributions to philosophy, still less in the schools of philosophy which they founded. Such was the older type of the professor at the best, he who best incarnated the spirit of the older college. At

the worst he was a repeater of the traditions and platitudes of his subject, incapable of guiding his students to an outlook on learning or on life.

The new professor became one primarily because he was interested in a department of learning and desired to study it. He did not find in teaching, in the presentation of his subject to undergraduates, the fulfillment of his purposes in life; he felt rather that teaching was a duty, whose performance gave him the opportunity for research. Thus the centre of his interest and of his influence has shifted from the older position, and the results of his work are correspondingly changed. At the best, his studies enrich learning with new and fundamental conceptions; his teaching attracts those who share his spirit of research, and he founds a school in his department; at the worst, he mechanically presents the details of a subject whose details he loves to study, but whose general truths and vital principles he is unable to grasp.

While these changes were going on in the body of the college's teaching, in the temper of its students, and in the personnel and spirit of its faculty, a third line of alteration was in progress, full of significance to the life of the college. If one is sufficiently interested in statistics to plot the curve of college attendance by years, he will find that the curve rises slowly, or remains nearly

stationary, until the later eighties, and then begins to rise rapidly and with an increasing rapidity to the present time. This means that the college was discovered by the public at about the date named. The "silver sea" which served this "little world"

> In the office of a wall,
> Or as a moat defensive to a house,

was crossed, and a new population swarmed into "this blessed plot, this earth, this realm," whose secluded happiness I have sketched.

Seclusion has become a thing of the past, and modern life with its rush and hurry pervades the college campus. I do not think that the college has ever enjoyed the change. Sometimes it has struggled against it, *multum reluctans*,[1] but vainly; more often it has contented itself with regrets for the past, and has looked back wistfully to older days. But the discovery was inevitable, and the results of the discovery equally so. So long as the college expected the public to accept its terms, to accept the education which it offered, or to leave it alone, it was safe from practical considerations. But when once it opened the door to modern knowledge, to modern methods, and to modern life, they naturally entered and dwelt with it. The college meant to open the door but a

[1] Very unwillingly.

little way. It did not invite these new guests to share the house on equal terms, but it found that, when once they had established themselves, they were no longer guests but members of the family. The new college, thus constituted, had necessarily a new life and a new spirit. It stood in new relations to the rest of the world. No longer master of a little world of its own, it had become the servant of a larger people.

Thus the college of to-day is to be contrasted rather than compared with that of forty years ago. Outer form and inner spirit have alike changed. Familiarity with the facts does not render less startling the increase in the numbers of teachers and students to-day as compared with those of the past; nor do we cease to wonder at the multiplication of buildings, and at the growth of endowments, at a rate unexampled in history. But these evidences of material change are slight beside the spiritual and educational differences.

It is by no means my purpose to pronounce a eulogy on the "good old times." For one reason, I am not yet old enough to do it gracefully. For another, my work since I left college has been to aid in building up a college of the newer type, in which I heartily believe. All of the alterations which I have described have been, on the whole, for the best. The movement has been natural,

necessary, inevitable; it has been upward as well as onward, and we who have given our years to help it forward have done so without the necessity for justification or apology. Yet we are not without regret for the life that has been left, while we welcome the new life into which we have entered. We hail the spirit of research,—the most fundamental of the changes which I have named,—we see the mighty intellectual uplift which it has contributed to our colleges. Yet it still may be permitted to us to regret the fine enjoyment of letters, the sense of elegant leisure, and of cultured pleasure, some part of which our colleges have lost. We are proud of the fact that our colleges yield to the community a more complete, a larger service than in the past. Yet we need not be ashamed to regret that in losing that narrowness which limited the influence of the older college, something of her independence has gone, and with it some part of that which made her influence precious.

In a word, we have paid a price for our new possessions; not an exorbitant price, I think; indeed, I believe it a small one to pay for great gains. Yet paid it has been and still must be; and, until fully paid, the college will suffer from the debt. The experimental method has become habitual to us. Nothing is fixed; nothing settled. The very narrowness of the old college, both in

purpose and method, made that purpose and method clear and consistent; but we who are continually adjusting and readjusting come at last to lose the sense of aim and to abandon method. We who are members of faculties have frankly given up the task of prescribing courses of study as an impossible one. We say that only omniscience can wisely prescribe a college course. We abandon the task as beyond our collective wisdom, and we look for the omniscience necessary to comprehend the possibilities of a college catalogue to the youth or maiden of eighteen, whom the high school sends to us. We do not desire technical studies in our college of liberal arts, but the more we read our catalogues, the more clearly we admit that we do not know what is a liberal and what a technical study. We end by admitting almost, or quite, all to our curriculum, and if we rule out any we are quite sure that we have admitted that which had as little claim. We do not wish to become preparatory schools for law or medicine. Yet we find that we must meet the fair and legitimate needs of our students who are to enter these professions. Thus we move: often drifting; always ill at ease with ourselves, because our plans and our methods are tentative and hesitant. Our aims, too, are incoherent. Do we desire to cultivate the intellectual life in our students, to prepare them for professional study, or to select out

of the mass of students the few who are fit for research and to train them? Or would we adhere to the traditional function of the older college? We would do all of these things; do them at once and in the same classes. No wonder that we fail to see just how to direct our teaching so as to secure results so diverse, so irreconcilable.

With this hesitation there has come a distraction of spirit. We have lost the "sweet serenity of books," and we have not gained the freedom of pure research. We have lost the independence born of detachment from life, and have not gained the poise of practical efficiency. We have lost the sense of the mastery of ourselves and of our public, and in all things we have become experimental. In brief, we have suffered, and are suffering, from that distraction of spirit which always accompanies great and rapidly acquired gains; gains too large to be quickly mastered or readily put to full and easy use.

What then shall we say of the college of the present if we bring it to Milton's test? Its graduates have far more skill than those of a generation or more ago. Numerous and widely varied courses bring into her class-rooms for discussion the principles which underlie every part of life. In a hundred ways the student is made to see for himself, to think for himself,—granting that he

has any capacity for thought,—where his father was only made to learn. Skill of both brain and hand is cultivated in a score of laboratories. If the college graduate of to-day does not enter on life more skillful than his father did, it is surely his own fault.

If the college of to-day is inferior to its predecessor in enabling its graduates to act justly, this is mainly because so many of them choose a course which deals with knowledge rather than with action. They will find, I think, less of inspiration with that increased knowledge, but if not so highly motived, their performance or duty will be more discriminating. They will have also the advantage that their thoughts have been turned to the problems for whose solution there is needed a discriminating justice. It was possible that the very elevation and consequent remoteness of the ideals of the old college should allow the graduate to hold them as matters for his leisure alone, not as a part of the motives for business and for public life. The graduate of to-day cannot fail to remember the teachings of his college on historical and social problems, as these press upon him in the first years of his active life for that answer which comes with practical decision; nor can he fail to be guided toward a broader and wiser justice in reaching his decisions.

I hesitate to touch the last term lest I should

be misunderstood; yet we must face the question: do the changes in college life tend toward a larger magnanimity? I do not think that we can fairly answer in the affirmative. I know that it is easy to be mistaken on this point. It is easy for us old graduates to see in the life of our own college days a greater magnanimity than was really present, and it is still easier for us to have a keen sense of the faults of to-day and to be insensitive toward its underlying strength of purpose. There has been an enormous increase of intellectual possessions, an increased attention to problems of knowledge rather than of conduct, a rapid multiplication of points of contact with the outside world, and a response to the demand of the world for skill. All these changes tend to usefulness, to increased efficiency, but not to magnanimity. Here is no indictment of the modern college, no thought that her life will not now, as in the past, inspire her sons and daughters, no suspicion that they will not play their full and worthy part in the world of to-morrow, as their fathers are doing in the world of to-day. It is a recognition at once of the fact that part of the price of progress has been a decline in the fine spirit of magnanimity, and of the duty which lies on the college to renew that spirit on wider and more secure conditions than those of the past.

I have ever believed that these ills are " growing

pains," and that in growth lies their only cure. We might as well agree at once that there will be no return to old conditions and methods. Men may, if it pleases them, talk eloquently of "harking back to the humanities," and no doubt the humanities will play a larger part in the college of the future than they do to-day, but they will never occupy the whole stage as they once did. The college curriculum is permanently enlarged. Very likely it has grown too far in certain directions. It probably includes less than it ought in other directions, and unquestionably any abridgment of its courses on one side will be more than offset by growth on others. The last forty years have enlarged the charter of liberal education, and the college catalogue only reflects this fact. We shall never return to the old, simple, self-centred college of the past. Our way out is the way on, and progress is the only solution of our difficulties. Time will bring with it an increasing mastery of our materials. We shall sooner or later cease to be always experimenting with everything. We shall still have enough material for experiment, but all studies will not always be in a state of unstable equilibrium. With this mastery of our material of teaching will come a clarifying of our purposes. We members of faculties will see again pretty clearly that some things in education are good for certain intellectual purposes. We shall ven-

ture to say so; and, when we do this, students will trust our judgment. Seeing our purposes, and understanding how to adjust our teaching so as to attain them, we shall directly seek such ends and consciously shape our courses of study so as to reach them.

There will be an enlargement of ideas, on the side of both student and teacher. The student will not cease to look to the college for a practical preparation for life, but he will enlarge his ideas of practicality. He will see that there is something practical in preparing for living, as well as in preparing for work. Many of the members of our senior classes to-day have shaped their college course with reference to the future study of medicine or of law. A generation later their sons will not be so eager as were their fathers to confine their college studies to the sciences immediately antecedent to their profession. Years will have brought a larger wisdom to the fathers and they will have learned that life, even for a physician, consists in something beyond the abundance of bacteriology and pathology. The coming lawyer may learn that it is not wholly practical for him to make his undergraduate course as nearly a legal one as is permitted by the conditions of election in his college. I am even so optimistic as to think it not impossible that even the general public will revise its notions of practicality. At any rate,

my experience as a teacher has seen one complete change of judgment in this matter. When I began to teach zoölogy my teeth were continually set on edge by the well-meaning friends who talked wisely of the practical nature of the study of science as contrasted with language. For the past fifteen years, or more, I have heard nothing of this. All are now aware that the study of science is no more practical, and no less so, than is the study of philosophy. To-day that "practicality" which once seemed to inhere in science is placed in the study of history and of economics. In fifteen years more the world may have learned that these new humanities are chiefly valuable, not as furnishing practical guides to the affairs of active life, but because they stand with the old humanities, with the sciences, with philosophy, as furnishing a way into the intellectual life. It may well be that students will learn that in coming to college they are seeking the intellectual life, and that the way in which they reach it matters little, so that the result have in it abundant vitality and many points of growth.

On the side of the faculties I look for the more complete recognition of the spirit of culture along with that of research. This process is already advanced in the departments of language. We rarely see to-day those extremes of science to which our language-teaching tended a decade, or

more, ago. Even candidates for the doctorate of philosophy are not set to work to count and tabulate the particles in an author's works, and throughout the ranks the students are more humanely treated. Yet such change comes readily in these departments, because the region of the known is so large and that is so small which is at once unknown and unknowable. In the sciences it will long be difficult to secure courses for culture. The unknown world of science is so vast, so close, that it beckons the student with an irresistible attraction. When the fields of knowledge are white to the harvest, it is not easy for the teacher to avoid recruiting laborers for them and setting them to work. Yet here, too, we shall find ways and methods for making the truths of science more available than they now are for training the average unscientific student, who does not expect to be a scientist, but who does need such a turn to his mind that he can orient himself in a world whose movement comes to depend more and more on science.

Progress toward shaping the college course for its proper work will be hastened by that revival of the ethical spirit in college which has already begun, and which will go on with increasing rapidity. The spirit of research, like any new ideal, has so filled our minds as to belittle older ideals and make them seem old-fashioned and inadequate.

Time will give us a better perspective, and we shall learn that the art of adjusting the subject to the mind of the college student is as difficult and as worthy of study as is the enlargement of the subject itself. The student will take his due place in the teacher's mind, not to the obscuring of the importance of the study, as was the case in the past; not hidden and dwarfed behind the subject, as is too often the case at present. They will stand side by side, and the teacher's main problem will be how to adjust one to the other, so that the study may enlarge the student's life and the student may come to share—though it may well be in small degree—the life of the study.

Thus the college of to-day has given first place in its curriculum, in its thought, and in its life, to the first of Milton's triad of qualities. It is seeking first of all to give its graduates skill in performing the offices of life. It places no low or unworthy meaning on the word. It aims at no result to be reached by precept. It seeks no cheap or hasty practicality. The skill sought is that which comes from the mastery of principles. The college attempts also to fit its students to deal justly in society, and for this result it looks to a careful training in the principles which underlie society, rather than to the free working of a general moral impulse. The college aims to secure for its graduates that magnanimity of which cul-

ture is a part, and which, like culture, can never be directly sought or inculcated. Yet this part of its purposes has been obscured by the response which it has made to the new and vigorous demands of a changing social order. New conditions have brought to the front new ideals, which for a time disturbed the balance of its life. The old life will not return, and if it could do so we should be even more dissatisfied with it than with the present. Neither reaction nor revolution will hasten the working of the vital forces which are perfecting the new life, whose adjustment will be reached as the new motives find their place beside the older. The new college will not swing back into the old life; but, embodying a higher skill than its predecessor, as well as a truer justice and a wider magnanimity, will yield to its students a more "complete and generous education."

AN ADDRESS TO STUDENTS[1]

JOHN TYNDALL

THERE is an idea regarding the nature of man which modern philosophy has sought, and is still seeking, to raise into clearness, the idea, namely, of secular growth. Man is not a thing of yesterday; nor do I imagine that the slightest controversial tinge is imported into this address when I say that he is not a thing of 6,000 years ago. Whether he came originally from stocks or stones, from nebulous gas or solar fire, I know not; if he had any such origin the process of his transformation is as inscrutable to you and to me as that of the grand old legend, according to which "the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." But, however obscure man's origin may be, his growth is not to be denied. Here a little and there a little added through the ages have slowly transformed him from what he was into what he is. The doctrine has been held that the mind of the

[1] An address to the students of University College, London, in the session 1868–69.

child is like a sheet of white paper, on which by education we can write what characters we please. This doctrine assuredly needs qualification and correction. In physics, when an external force is applied to a body with a view of affecting its inner texture, if we wish to predict the result, we must know whether the external force conspires with or opposes the internal forces of the body itself; and in bringing the influence of education to bear upon the new-born man his inner powers must be also taken into account. He comes to us as a bundle of inherited capacities and tendencies, labelled "from the indefinite past to the indefinite future;" and he makes his transit from the one to the other through the education of the present time. The object of that education is, or ought to be, to provide wise exercise for his capacities, wise direction for his tendencies, and through this exercise and this direction to furnish his mind with such knowledge as may contribute to the usefulness, the beauty, and the nobleness of his life.

How is this discipline to be secured, this knowledge imparted? Two rival methods now solicit attention—the one organized and equipped, the labor of centuries having been expended in bringing it to its present state of perfection; the other, more or less chaotic, but becoming daily less so, and giving signs of enormous power, both as a source of knowledge and as a means of discipline.

These two methods are the classical and the scientific method. I wish they were not rivals; it is only bigotry and short-sightedness that make them so; for assuredly it is possible to give both of them fair play. Though hardly authorized to express any opinion whatever upon the subject, I nevertheless hold the opinion that the proper study of a language is an intellectual discipline of the highest kind. If I except discussions on the comparative merits of popery and Protestantism, English grammar was the most important discipline of my boyhood. The piercing through the involved and inverted sentences of "Paradise Lost;" the linking of the verb to its often distant nominative, of the relative to its distant antecedent, of the agent to the object of the transitive verb, of the preposition to the noun or pronoun which it governed—the study of variations in mood and tense, the transformations often necessary to bring out the true grammatical structure of a sentence—all this was to my young mind a discipline of the highest value, and, indeed, a source of unflagging delight. How I rejoiced when I found a great author tripping, and was fairly able to pin him to a corner from which there was no escape! As I speak, some of the sentences which exercised me when a boy rise to my recollection. "He that hath ears to hear let him hear." That was one of them, where the

"He" is left, as it were, floating in mid air without any verb to support it. I speak thus of English because it was of real value to me. I do not speak of other languages because their educational value for me was almost insensible. But, knowing the value of English so well, I should be the last to deny, or even to doubt, the high discipline involved in the proper study of Latin and Greek.

That study, moreover, has other merits and recommendations which have been already slightly touched upon. It is organized and systematized by long-continued use. It is an instrument wielded by some of the best intellects of the country in the education of youth; and it can point to results in the achievements of our foremost men. What, then, has science to offer which is in the least degree likely to compete with such a system? I cannot better reply than by recurring to the grand old story from which I have already quoted. Speaking of the world and all that therein is, of the sky and the stars around it, the ancient writer says, "And God saw all that he had made, and behold it was very good." It is the body of things thus described which science offers to the study of man. There is a very renowned argument much prized and much quoted by theologians, in which the universe is compared to a watch. Let us deal practically with this comparison. Supposing a watchmaker, having com-

pleted his instrument, to be so satisfied with his work as to call it very good, what would you understand him to mean? You would not suppose that he referred to the dial-plate in front and the chasing of the case behind, so much as to the wheels and pinions, the springs and jewelled pivots of the works within, those qualities and powers, in short, which enable the watch to perform accurately its work as a keeper of time. With regard to the knowledge of such a watch he would be a mere ignoramus who would content himself with outward inspection. I do not wish to say one severe word here to-day, but I fear that many of those who are very loud in their praise of the works of the Lord know them only in this outside and superficial way. It is the inner works of the universe which science reverently uncovers; it is the study of these that she recommends as a discipline worthy of all acceptation.

The ultimate problem of physics is to reduce matter by analysis to its lowest condition of divisibility, and force to its simplest manifestations, and then by synthesis to construct from these elements the world as it stands. We are still a long way from the final solution of this problem; and when the solution comes, it will be one more of spiritual insight than of actual observation. But though we are still a long way from this complete intellectual mastery of Nature, we have con-

quered vast regions of it, have learned their polities and the play of their powers. We live upon a ball of matter eight thousand miles in diameter, swathed by an atmosphere of unknown height. This ball has been molten by heat, chilled to a solid, and sculptured by water; it is made up of substances possessing distinctive properties and modes of action, properties which have an immediate bearing upon the continuance of man in health, and on his recovery from disease, on which moreover depend all the arts of industrial life. These properties and modes of action offer problems to the intellect, some profitable to the child, and others sufficient to tax the highest powers of the philosopher. Our native sphere turns on its axis and revolves in space. It is one of a band which do the same. It is illuminated by a sun which, though nearly a hundred millions of miles distant, can be brought virtually into our closets and there subjected to examination. It has its winds and clouds, its rain and frost, its light, heat, sound, electricity, and magnetism. And it has its vast kingdoms of animals and vegetables. To a most amazing extent the human mind has conquered these things, and revealed the logic which runs through them. Were they facts only, without logical relationship, science might, as a means of discipline, suffer in comparison with language. But the whole body of phenomena is instinct with

law; the facts are hung on principles, and the value of physical science as a means of discipline consists in the motion of the intellect, both inductively and deductively, along the lines of law marked out by phenomena. As regards that discipline to which I have already referred as derivable from the study of languages—that, and more, are involved in the study of physical science. Indeed, I believe it would be possible so to limit and arrange the study of a portion of physics as to render the mental exercise involved in it almost qualitatively the same as that involved in the unravelling of a language.

I have thus far limited myself to the purely intellectual side of this question. But man is not all intellect. If he were so, science would, I believe, be his proper nutriment. But he feels as well as thinks; he is receptive of the sublime and the beautiful as well as of the true. Indeed, I believe that even the intellectual action of a complete man is, consciously or unconsciously, sustained by an under-current of the emotions. It is vain, I think, to attempt to separate moral and emotional nature from intellectual nature. Let a man but observe himself, and he will, if I mistake not, find that in nine cases out of ten, moral or immoral considerations, as the case may be, are the motive force which pushes his intellect into action. The reading of the works of two men,

neither of them imbued with the spirit of modern science, neither of them, indeed, friendly to that spirit, has placed me here to-day. These men are the English Carlyle and the American Emerson. I must ever remember with gratitude that through three long, cold German winters Carlyle placed me in my tub, even when ice was on its surface, at five o'clock every morning; not slavishly, but cheerfully, meeting each day's studies with a resolute will, determined whether victor or vanquished not to shrink from difficulty. I never should have gone through analytical geometry and the calculus had it not been for those men. I never should have become a physical investigator, and hence without them I should not have been here to-day. They told me what I ought to do in a way that caused me to do it, and all my consequent intellectual action is to be traced to this purely moral source. To Carlyle and Emerson I ought to add Fichte, the greatest representative of pure idealism. These three unscientific men made me a practical scientific worker. They called out, "Act!" I hearkened to the summons, taking the liberty, however, of determining for myself the direction which effort was to take.

And I may now cry, "Act!" but the potency of action must be yours. I may pull the trigger, but if the gun be not charged there is no result. We are creators in the intellectual world as little

as in the physical. We may remove obstacles, and render latent capacities active, but we cannot suddenly change the nature of man. The "new birth" itself implies the preëxistence of the new character which requires not to be created but brought forth. You cannot by any amount of missionary labor suddenly transform the savage into the civilized Christian. The improvement of man is *secular*—not the work of an hour or of a day. But though indubitably bound by our organizations, no man knows what the potentialities of any human mind may be, which require only release to be brought into action. Let me illustrate this point. There are in the mineral world certain crystals, certain forms, for instance, of fluor-spar, which have lain darkly in the earth for ages, but which nevertheless have a potency of light locked up within them. In their case the potential has never become actual—the light is in fact held back by a molecular detent. When these crystals are warmed, the detent is lifted, and an outflow of light immediately begins. I know not how many of you may be in the condition of this fluor-spar. For aught I know, every one of you may be in this condition, requiring but the proper agent to be applied—the proper word to be spoken—to remove a detent, and to render you conscious of light within yourselves and sources of light to others.

The circle of human nature, then, is not complete without the arc of feeling and emotion. The lilies of the field have a value for us beyond their botanical ones—a certain lightening of the heart accompanies the declaration that "Solomon in all his glory was not arrayed like one of these." The sound of the village bell which comes mellowed from the valley to the traveller upon the hill, has a value beyond its acoustical one. The setting sun when it mantles with the bloom of roses the alpine snows, has a value beyond its optical one. The starry heavens, as you know, had for Immanuel Kant a value beyond their astronomical one. Round about the intellect sweeps the horizon of emotions from which all our noblest impulses are derived. I think it very desirable to keep this horizon open; not to permit either priest or philosopher to draw down his shutters between you and it. And here the dead languages, which are sure to be beaten by science in the purely intellectual fight, have an irresistible claim. They supplement the work of science by exalting and refining the æsthetic faculty, and must on this account be cherished by all who desire to see human culture complete. There must be a reason for the fascination which these languages have so long exercised upon the most powerful and elevated minds—a fascination which will probably

continue for men of Greek and Roman mould to the end of time.

In connection with this question of the emotions one very obvious danger besets many of the more earnest spirits of our day—the danger of *haste* in endeavoring to give the feelings repose. We are distracted by systems of theology and philosophy which were taught to us when young, and which now excite in us a hunger and a thirst for knowledge not proved to be attainable. There are periods when the judgment ought to remain in suspense, the data on which a decision might be based being absent. This discipline of suspending the judgment is a common one in science, but not so common as it ought to be elsewhere. I walked down Regent Street some time ago with a man of great gifts and acquirements, discussing with him various theological questions. I could not accept his views of the origin and destiny of the universe, nor was I prepared to enunciate any definite views of my own. He turned to me at length and said, "You surely must have a theory of the universe." That I should in one way or another have solved this mystery of mysteries seemed to my friend a matter of course. "I have not even a theory of magnetism," was my reply. We ought to learn to wait, and pause before closing with the advances of those expounders of the ways of God

to men, who offer us intellectual peace at the modest cost of intellectual life.

The teachers of the world ought to be its best men, and for the present at all events such men must learn self-trust. They must learn more and more to do without external aid; save such aid as comes from the contemplation of a universe, which, though it baffles the intellect, can elevate the heart. But they must learn to feel the mystery of that universe without attempting to give it a rigid form, personal or otherwise. By the fulness and freshness of their own lives and utterances they must awaken life in others. The position of science is already assured, but I think the poet also will have a great part to play in the future of the world. To him it is given for a long time to come to fill those shores which the recession of the theologic tide has left exposed; to him, when he rightly understands his mission, and does not flinch from the tonic discipline which it assuredly demands, we have a right to look for that heightening and brightening of life which so many of us need. He ought to be the interpreter of that power which as

> Jehovah, Jove, or Lord,

has hitherto filled and strengthened the human heart.

Let me utter one practical word in conclusion—

take care of your health. There have been men who by wise attention to this point might have risen to any eminence—might have made great discoveries, written great poems, commanded armies, or ruled states, but who by unwise neglect of this point have come to nothing. Imagine Hercules as oarsman in a rotten boat; what can he do there but by the very force of his stroke expedite the ruin of his craft. Take care then of the timbers of your boat, and avoid all practices likely to introduce either wet or dry rot among them. And this is not to be accomplished by desultory or intermittent efforts of the will, but by the formation of *habits*. The will no doubt has sometimes to put forth its strength in order to strangle or crush the special temptation. But the formation of right habits is essential to your permanent security. They diminish your chance of falling when assailed, and they augment your chance of recovery when overthrown.

LITERATURE AND SCIENCE[1]

MATTHEW ARNOLD

Practical people talk with a smile of Plato and of his absolute ideas; and it is impossible to deny that Plato's ideas do often seem unpractical and impracticable, and especially when one views them in connection with the life of a great work-a-day world like the United States. The necessary staple of the life of such a world Plato regards with disdain; handicraft and trade and the working professions he regards with disdain; but what becomes of the life of an industrial modern community if you take handicraft and trade and the working professions out of it? The base mechanic arts and handicrafts, says Plato, bring about a natural weakness in the principle of excellence in a man, so that he cannot govern the ignoble growths in him, but nurses them, and cannot understand fostering any other. Those who exercise such arts and trades, as they have their bodies, he says, marred by their vulgar businesses, so they

[1] An address delivered repeatedly during a visit to America in 1883-84. Reprinted through the generous permission of The Macmillan Company.

have their souls, too, bowed and broken by them. And if one of these uncomely people has a mind to seek self-culture and philosophy, Plato compares him to a bald little tinker, who has scraped together money, and has got his release from service, and has had a bath, and bought a new coat, and is rigged out like a bridegroom about to marry the daughter of his master who has fallen into poor and helpless estate.

Nor do the working professions fare any better than trade at the hands of Plato. He draws for us an inimitable picture of the working lawyer, and of his life of bondage; he shows how this bondage from his youth up has stunted and warped him, and made him small and crooked of soul, encompassing him with difficulties which he is not man enough to rely on justice and truth as means to encounter, but has recourse, for help out of them, to falsehood and wrong. And so, says Plato, this poor creature is bent and broken, and grows up from boy to man without a particle of soundness in him, although exceedingly smart and clever in his own esteem.

One cannot refuse to admire the artist who draws these pictures. But we say to ourselves that his ideas show the influence of a primitive and obsolete order of things, when the warrior caste and the priestly caste were alone in honor, and the humble work of the world was done by slaves.

We have now changed all that; the modern majority consists in work, as Emerson declares; and in work, we may add, principally of such plain and dusty kind as the work of cultivators of the ground, handicraftsmen, men of trade and business, men of the working professions. Above all is this true in a great industrious community such as that of the United States.

Now education, many people go on to say, is still mainly governed by the ideas of men like Plato, who lived when the warrior caste and the priestly or philosophical class were alone in honor, and the really useful part of the community were slaves. It is an education fitted for persons of leisure in such a community. This education passed from Greece and Rome to the feudal communities of Europe, where also the warrior caste and the priestly caste were alone held in honor, and where the really useful and working part of the community, though not nominally slaves as in the pagan world, were practically not much better off than slaves, and not more seriously regarded. And how absurd it is, people end by saying, to inflict this education upon an industrious modern community, where very few indeed are persons of leisure, and the mass to be considered has not leisure, but is bound, for its own great good, and for the great good of the world at large, to plain labor and to industrial pursuits, and the educa-

tion in question tends necessarily to make men dissatisfied with these pursuits and unfitted for them!

That is what is said. So far I must defend Plato, as to plead that his view of education and studies is in the general, as it seems to me, sound enough, and fitted for all sorts and conditions of men, whatever their pursuits may be. "An intelligent man," says Plato, "will prize those studies which result in his soul getting soberness, righteousness, and wisdom, and will less value the others." I cannot consider *that* a bad description of the aim of education, and of the motives which should govern us in the choice of studies, whether we are preparing ourselves for a hereditary seat in the English House of Lords or for the pork trade in Chicago.

Still I admit that Plato's world was not ours, that his scorn of trade and handicraft is fantastic, that he had no conception of a great industrial community such as that of the United States, and that such a community must and will shape its education to suit its own needs. If the usual education handed down to it from the past does not suit it, it will certainly before long drop this and try another. The usual education in the past has been mainly literary. The question is whether the studies which were long supposed to be the best for all of us are practically the best now; whether others are not better. The tyranny of the past,

many think, weighs on us injuriously in the predominance given to letters in education. The question is raised whether, to meet the needs of our modern life, the predominance ought not now to pass from letters to science; and naturally the question is nowhere raised with more energy than here in the United States. The design of abasing what is called "mere literary instruction and education," and of exalting what is called "sound, extensive, and practical scientific knowledge," is, in this intensely modern world of the United States, even more perhaps than in Europe, a very popular design, and makes great and rapid progress.

I am going to ask whether the present movement for ousting letters from their old predominance in education, and for transferring the predominance in education to the natural sciences, whether this brisk and flourishing movement ought to prevail, and whether it is likely that in the end it really will prevail. An objection may be raised which I will anticipate. My own studies have been almost wholly in letters, and my visits to the field of the natural sciences have been very slight and inadequate, although those sciences have always strongly moved my curiosity. A man of letters, it will perhaps be said, is not competent to discuss the comparative merits of letters and natural science as means of education. To this objection I reply, first of all, that his incompetence, if he at-

tempts the discussion but is really incompetent for it, will be abundantly visible; nobody will be taken in; he will have plenty of sharp observers and critics to save mankind from that danger. But the line I am going to follow is, as you will soon discover, so extremely simple, that perhaps it may be followed without failure even by one who for a more ambitious line of discussion would be quite incompetent.

Some of you may possibly remember a phrase of mine which has been the object of a good deal of comment; an observation to the effect that in our culture, the aim being *to know ourselves and the world*, we have, as the means to this end, *to know the best which has been thought and said in the world*. A man of science, who is also an excellent writer and the very prince of debaters, Professor Huxley, in a discourse at the opening of Sir Josiah Mason's college at Birmingham, laying hold of this phrase, expanded it by quoting some more words of mine, which are these: "The civilized world is to be regarded as now being, for intellectual and spiritual purposes, one great confederation, bound to a joint action and working to a common result; and whose members have for their proper outfit a knowledge of Greek, Roman, and Eastern antiquity, and of one another. Special local and temporary advantages being put out of account, that modern nation will in the intel-

lectual and spiritual sphere make most progress, which most thoroughly carries out this programme."

Now on my phrase, thus enlarged, Professor Huxley remarks that when I speak of the above-mentioned knowledge as enabling us to know ourselves and the world, I assert *literature* to contain the materials which suffice for thus making us know ourselves and the world. But it is not by any means clear, says he, that after having learnt all which ancient and modern literatures have to tell us, we have laid a sufficiently broad and deep foundation for that criticism of life, that knowledge of ourselves and the world, which constitutes culture. On the contrary, Professor Huxley declares that he finds himself "wholly unable to admit that either nations or individuals will really advance, if their outfit draws nothing from the stores of physical science. An army without weapons of precision, and with no particular base of operations, might more hopefully enter upon a campaign on the Rhine, than a man, devoid of a knowledge of what physical science has done in the last century, upon a criticism of life."

This shows how needful it is for those who are to discuss any matter together, to have a common understanding as to the sense of the terms they employ,—how needful, and how difficult. What Professor Huxley says, implies just the reproach

which is so often brought against the study of *belles lettres*, as they are called: that the study is an elegant one, but slight and ineffectual; a smattering of Greek and Latin and other ornamental things, of little use for any one whose object is to get at truth, and to be a practical man. So, too, M. Renan talks of the "superficial humanism" of a school-course which treats us as if we were all going to be poets, writers, preachers, orators, and he opposes this humanism to positive science, or the critical search after truth. And there is always a tendency in those who are remonstrating against the predominance of letters in education, to understand by letters *belles lettres*, and by *belles lettres* a superficial humanism, the opposite of science or true knowledge.

But when we talk of knowing Greek and Roman antiquity, for instance, which is the knowledge people have called the humanities, I for my part mean a knowledge which is something more than a superficial humanism, mainly decorative. "I call all teaching *scientific*," says Wolf, the critic of Homer, "which is systematically laid out and followed up to its original sources. For example: a knowledge of classical antiquity is scientific when the remains of classical antiquity are correctly studied in the original languages." There can be no doubt that Wolf is perfectly right; that all learning is scientific which is systematically

laid out and followed up to its original sources, and that a genuine humanism is scientific.

When I speak of knowing Greek and Roman antiquity, therefore, as a help to knowing ourselves and the world, I mean more than a knowledge of so much vocabulary, so much grammar, so many portions of authors in the Greek and Latin languages, I mean knowing the Greeks and Romans, and their life and genius, and what they were and did in the world; what we get from them, and what is its value. That, at least, is the ideal; and when we talk of endeavoring to know Greek and Roman antiquity, as a help to knowing ourselves and the world, we mean endeavoring so to know them as to satisfy this ideal, however much we may still fall short of it.

The same also as to knowing our own and other modern nations, with the like aim of getting to understand ourselves and the world. To know the best that has been thought and said by the modern nations, is to know, says Professor Huxley, "only what modern *literatures* have to tell us; it is the criticism of life contained in modern literature." And yet "the distinctive character of our times," he urges, "lies in the vast and constantly increasing part which is played by natural knowledge." And how, therefore, can a man, devoid of knowledge of what physical science has done in the last

century, enter hopefully upon a criticism of modern life?

Let us, I say, be agreed about the meaning of the terms we are using. I talk of knowing the best which has been thought and uttered in the world; Professor Huxley says this means knowing *literature*. Literature is a large word; it may mean everything written with letters or printed in a book. Euclid's *Elements* and Newton's *Principia* are thus literature. All knowledge that reaches us through books is literature. But by literature Professor Huxley means *belles lettres*. He means to make me say, that knowing the best which has been thought and said by the modern nations is knowing their *belles lettres* and no more. And this is no sufficient equipment, he argues, for a criticism of modern life. But as I do not mean, by knowing ancient Rome, knowing merely more or less of Latin *belles lettres*, and taking no account of Rome's military, and political, and legal, and administrative work in the world; and as, by knowing ancient Greece, I understand knowing her as the giver of Greek art, and the guide to a free and right use of reason and to scientific method, and the founder of our mathematics and physics and astronomy and biology,—I understand knowing her as all this, and not merely knowing certain Greek poems, and histories, and treatises, and speeches,—so as to the knowledge of modern na-

tions also. By knowing modern nations, I mean not merely knowing their *belles lettres*, but knowing also what has been done by such men as Copernicus, Galileo, Newton, Darwin. "Our ancestors learned," says Professor Huxley, "that the earth is the centre of the visible universe, and that man is the cynosure of things terrestrial; and more especially was it inculcated that the course of nature had no fixed order, but that it could be, and constantly was, altered." But for us now, continues Professor Huxley, "the notions of the beginning and the end of the world entertained by our forefathers are no longer credible. It is very certain that the earth is not the chief body in the material universe, and that the world is not subordinated to man's use. It is even more certain that nature is the expression of a definite order, with which nothing interferes." "And yet," he cries, "the purely classical education advocated by the representatives of the humanists in our day gives no inkling of all this!"

In due place and time I will just touch upon that vexed question of classical education; but at present the question is as to what is meant by knowing the best which modern nations have thought and said. It is not knowing their *belles lettres* merely which is meant. To know Italian *belles lettres* is not to know Italy, and to know English *belles lettres* is not to know England.

Into knowing Italy and England there comes a great deal more, Galileo and Newton amongst it. The reproach of being a superficial humanism, a tincture of *belles lettres*, may attach rightly enough to some other disciplines; but to the particular discipline recommended when I proposed knowing the best that has been thought and said in the world, it does not apply. In that best I certainly include what in modern times has been thought and said by the great observers and knowers of nature.

There is, therefore, really no question between Professor Huxley and me as to whether knowing the great results of the modern scientific study of nature is not required as a part of our culture, as well as knowing the products of literature and art. But to follow the processes by which those results are reached, ought, say the friends of physical science, to be made the staple of education for the bulk of mankind. And here there does arise a question between those whom Professor Huxley calls with playful sarcasm "the Levites of culture," and those whom the poor humanist is sometimes apt to regard as its Nebuchadnezzars.

The great results of the scientific investigation of nature we are agreed upon knowing, but how much of our study are we bound to give to the processes by which those results are reached? The results have their visible bearing on human life.

But all the processes, too, all the items of fact, by which those results are reached and established, are interesting. All knowledge is interesting to a wise man, and the knowledge of nature is interesting to all men. It is very interesting to know, that, from the albuminous white of the egg, the chick in the egg gets the materials for its flesh, bones, blood, and feathers; while, from the fatty yolk of the egg, it gets the heat and energy which enable it at length to break its shell and begin the world. It is less interesting, perhaps, but still it is interesting, to know that when a taper burns, the wax is converted into carbonic acid and water. Moreover, it is quite true that the habit of dealing with facts, which is given by the study of nature, is, as the friends of physical science praise it for being, an excellent discipline. The appeal, in the study of nature, is constantly to observation and experiment; not only is it said that the thing is so, but we can be made to see that it is so. Not only does a man tell us that when a taper burns the wax is converted into carbonic acid and water, as a man may tell us, if he likes, that Charon is punting his ferry-boat on the river Styx, or that Victor Hugo is a sublime poet, or Mr. Gladstone the most admirable of statesmen; but we are made to see that the conversion into carbonic acid and water does actually happen. This reality of natural knowledge it is, which makes the friends of

physical science contrast it, as a knowledge of things, with the humanist's knowledge, which is, say they, a knowledge of words. And hence Professor Huxley is moved to lay it down that, "for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education." And a certain President of the Section for Mechanical Science in the British Association is, in Scripture phrase, "very bold," and declares that if a man, in his mental training, "has substituted literature and history for natural science, he has chosen the less useful alternative." But whether we go these lengths or not, we must all admit that in natural science the habit gained of dealing with facts is a most valuable discipline, and that every one should have some experience of it.

More than this, however, is demanded by the reformers. It is proposed to make the training in natural science the main part of education, for the great majority of mankind at any rate. And here, I confess, I part company with the friends of physical science, with whom up to this point I have been agreeing. In differing from them, however, I wish to proceed with the utmost caution and diffidence. The smallness of my own acquaintance with the disciplines of natural science is ever before my mind, and I am fearful of doing these disciplines an injustice. The ability and

pugnacity of the partisans of natural science make them formidable persons to contradict. The tone of tentative inquiry, which befits a being of dim faculties and bounded knowledge, is the tone I would wish to take and not to depart from. At present it seems to me, that those who are for giving to natural knowledge, as they call it, the chief place in the education of the majority of mankind, leave one important thing out of their account: the constitution of human nature. But I put this forward on the strength of some facts not at all recondite, very far from it; facts capable of being stated in the simplest possible fashion, and to which, if I so state them, the man of science will, I am sure, be willing to allow their due weight.

Deny the facts altogether, I think, he hardly can. He can hardly deny, that when we set ourselves to enumerate the powers which go to the building up of human life, and say that they are the power of conduct, the power of intellect and knowledge, the power of beauty, and the power of social life and manners,—he can hardly deny that this scheme, though drawn in rough and plain lines enough, and not pretending to scientific exactness, does yet give a fairly true representation of the matter. Human nature is built up by these powers; we have the need for them all. When we have rightly met and adjusted the

claims of them all, we shall then be in a fair way for getting soberness and righteousness, with wisdom. This is evident enough, and the friends of physical science would admit it.

But perhaps they may not have sufficiently observed another thing: namely, that the several powers just mentioned are not isolated, but there is, in the generality of mankind, a perpetual tendency to relate them one to another in divers ways. With one such way of relating them I am particularly concerned now. Following our instinct for intellect and knowledge, we acquire pieces of knowledge; and presently, in the generality of men, there arises the desire to relate these pieces of knowledge to our sense for conduct, to our sense for beauty,—and there is weariness and dissatisfaction if the desire is baulked. Now in this desire lies, I think, the strength of that hold which letters have upon us.

All knowledge is, as I said just now, interesting; and even items of knowledge which from the nature of the case cannot well be related, but must stand isolated in our thoughts, have their interest. Even lists of exceptions have their interest. If we are studying Greek accents, it is interesting to know that *pais* and *pas*, and some other monosyllables of the same form of declension, do not take the circumflex upon the last syllable of the genitive plural, but vary, in this

respect, from the common rule. If we are studying physiology, it is interesting to know that the pulmonary artery carries dark blood and the pulmonary vein carries bright blood, departing in this respect from the common rule for the division of labor between the veins and the arteries. But every one knows how we seek naturally to combine the pieces of our knowledge together, to bring them under general rules, to relate them to principles; and how unsatisfactory and tiresome it would be to go on for ever learning lists of exceptions, or accumulating items of fact which must stand isolated.

Well, that same need of relating our knowledge, which operates here within the sphere of our knowledge itself, we shall find operating, also, outside that sphere. We experience, as we go on learning and knowing,—the vast majority of us experience,—the need of relating what we have learnt and known to the sense which we have in us for conduct, to the sense which we have in us for beauty.

A certain Greek prophetess of Mantineia in Arcadia, Diotima by name, once explained to the philosopher Socrates that love, and impulse, and bent of all kinds, is, in fact, nothing else but the desire in men that good should for ever be present to them. This desire for good, Diotima assured Socrates, is our fundamental desire, of which

fundamental desire every impulse in us is only some one particular form. And therefore this fundamental desire it is, I suppose,—this desire in men that good should be for ever present to them,—which acts in us when we feel the impulse for relating our knowledge to our sense for conduct and to our sense for beauty. At any rate, with men in general the instinct exists. Such is human nature. And the instinct, it will be admitted, is innocent, and human nature is preserved by our following the lead of its innocent instincts. Therefore, in seeking to gratify this instinct in question, we are following the instinct of self-preservation in humanity.

But, no doubt, some kinds of knowledge cannot be made to directly serve the instinct in question, cannot be directly related to the sense for beauty, to the sense for conduct. These are instrument-knowledges; they lead on to other knowledges, which can. A man who passes his life in instrument-knowledges is a specialist. They may be invaluable as instruments to something beyond, for those who have the gift thus to employ them; and they may be disciplines in themselves wherein it is useful for every one to have some schooling. But it is inconceivable that the generality of men should pass all their mental life with Greek accents or with formal logic. My friend Professor Sylvester, who is one of the first mathematicians

in the world, holds transcendental doctrines as to the virtue of mathematics, but those doctrines are not for common men. In the very Senate House and heart of our English Cambridge I once ventured, though not without an apology for my profaneness, to hazard the opinion that for the majority of mankind a little of mathematics, even, goes a long way. Of course this is quite consistent with their being of immense importance as an instrument to something else; but it is the few who have the aptitude for thus using them, not the bulk of mankind.

The natural sciences do not, however, stand on the same footing with these instrument-knowledges. Experience shows us that the generality of men will find more interest in learning that, when a taper burns, the wax is converted into carbonic acid and water, or in learning the explanation of the phenomenon of dew, or in learning how the circulation of the blood is carried on, than they find in learning that the genitive plural of *pais* and *pas* does not take the circumflex on the termination. And one piece of natural knowledge is added to another, and others are added to that, and at last we come to propositions so interesting as Mr. Darwin's famous proposition that "our ancestor was a hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits." Or we come to propositions of such

reach and magnitude as those which Professor Huxley delivers, when he says that the notions of our forefathers about the beginning and the end of the world were all wrong, and that nature is the expression of a definite order with which nothing interferes.

Interesting, indeed, these results of science are, important they are, and we should all of us be acquainted with them. But what I now wish you to mark is, that we are still, when they are propounded to us and we receive them, we are still in the sphere of intellect and knowledge. And for the generality of men there will be found, I say, to arise, when they have duly taken in the proposition that their ancestor was "a hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits," there will be found to arise an invincible desire to relate this proposition to the sense in us for conduct, and to the sense in us for beauty. But this the men of science will not do for us, and will hardly even profess to do. They will give us other pieces of knowledge, other facts, about other animals and their ancestors, or about plants, or about stones, or about stars; and they may finally bring us to those great "general conceptions of the universe, which are forced upon us all," says Professor Huxley, "by the progress of physical science." But still it will be *knowledge* only which they give

us; knowledge not put for us into relation with our sense for conduct, our sense for beauty, and touched with emotion by being so put; not thus put for us, and therefore, to the majority of mankind, after a certain while, unsatisfying, wearying.

Not to the born naturalist, I admit. But what do we mean by a born naturalist? We mean a man in whom the zeal for observing nature is so uncommonly strong and eminent, that it marks him off from the bulk of mankind. Such a man will pass his life happily in collecting natural knowledge and reasoning upon it, and will ask for nothing, or hardly anything, more. I have heard it said that the sagacious and admirable naturalist whom we lost not very long ago, Mr. Darwin, once owned to a friend that for his part he did not experience the necessity for two things which most men find so necessary to them,—religion and poetry; science and the domestic affections, he thought, were enough. To a born naturalist, I can well understand that this should seem so. So absorbing is his occupation with nature, so strong his love for his occupation, that he goes on acquiring natural knowledge and reasoning upon it, and has little time or inclination for thinking about getting it related to the desire in man for conduct, the desire in man for beauty. He relates it to them for himself as he goes along, so far as he feels the need; and he draws from the do-

mestic affections all the additional solace necessary. But then Darwins are extremely rare. Another great and admirable master of natural knowledge, Faraday, was a Sandemanian. That is to say, he related his knowledge to his instinct for conduct and to his instinct for beauty, by the aid of that respectable Scottish sectary, Robert Sandeman. And so strong, in general, is the demand of religion and poetry to have their share in a man, to associate themselves with his knowing, and to relieve and rejoice it, that, probably, for one man amongst us with the disposition to do as Darwin did in this respect, there are at least fifty with the disposition to do as Faraday.

Education lays hold upon us, in fact, by satisfying this demand. Professor Huxley holds up to scorn mediæval education, with its neglect of the knowledge of nature, its poverty even of literary studies, its formal logic devoted to "showing how and why that which the Church said was true must be true." But the great mediæval Universities were not brought into being, we may be sure, by the zeal for giving a jejune and contemptible education. Kings have been their nursing fathers, and queens have been their nursing mothers, but not for this. The mediæval Universities came into being, because the supposed knowledge, delivered by Scripture and the Church, so deeply engaged men's hearts, by so simply, easily, and powerfully

relating itself to their desire for conduct, their desire for beauty. All other knowledge was dominated by this supposed knowledge and was subordinated to it, because of the surpassing strength of the hold which it gained upon the affections of men, by allying itself profoundly with their sense for conduct, their sense for beauty.

But now, says Professor Huxley, conceptions of the universe fatal to the notions held by our forefathers have been forced upon us by physical science. Grant to him that they are thus fatal, that the new conceptions must and will soon become current everywhere, and that every one will finally perceive them to be fatal to the beliefs of our forefathers. The need of humane letters, as they are truly called, because they serve the paramount desire in men that good should be for ever present to them,—the need of humane letters, to establish a relation between the new conceptions, and our instinct for beauty, our instinct for conduct, is only the more visible. The Middle Age could do without humane letters, as it could do without the study of nature, because its supposed knowledge was made to engage its emotions so powerfully. Grant that the supposed knowledge disappears, its power of being made to engage the emotions will of course disappear along with it,—but the emotions themselves, and their claim to be engaged and satisfied, will remain. Now if

we find by experience that humane letters have an undeniable power of engaging the emotions, the importance of humane letters in a man's training becomes not less, but greater, in proportion to the success of modern science in extirpating what it calls "mediæval thinking."

Have humane letters, then, have poetry and eloquence, the power here attributed to them of engaging the emotions, and do they exercise it? And if they have it and exercise it, *how* do they exercise it, so as to exert an influence upon man's sense for conduct, his sense for beauty? Finally, even if they both can and do exert an influence upon the senses in question, how are they to relate to them the results,—the modern results,—of natural science? All these questions may be asked. First, have poetry and eloquence the power of calling out the emotions? The appeal is to experience. Experience shows that for the vast majority of men, for mankind in general, they have the power. Next, do they exercise it? They do. But then, *how* do they exercise it so as to affect man's sense for conduct, his sense for beauty? And this is perhaps a case for applying the Preacher's words: "Though a man labor to seek it out, yet he shall not find it; yea, farther, though a wise man think to know it, yet shall he not be able to find it." [1] Why should it be one

[1] *Ecclesiastes*, viii. 17. [Author's note.]

thing, in its effect upon the emotions, to say, "Patience is a virtue," and quite another thing, in its effect upon the emotions, to say with Homer,

τλητὸν γὰρ Μοῖραι θυμὸν θέσαν ἀνθρώποισιν—[1]

"for an enduring heart have the destinies appointed to the children of men"? Why should it be one thing, in its effect upon the emotions, to say with the philosopher Spinoza, *Felicitas in eo consistit quod homo suum esse conservare potest*—"Man's happiness consists in his being able to preserve his own essence," and quite another thing, in its effect upon the emotions, to say with the Gospel, "What is a man advantaged, if he gain the whole world, and lose himself, forfeit himself?" How does this difference of effect arise? I cannot tell, and I am not much concerned to know; the important thing is that it does arise, and that we can profit by it. But how, finally, are poetry and eloquence to exercise the power of relating the modern results of natural science to man's instinct for conduct, his instinct for beauty? And here again I answer that I do not know *how* they will exercise it, but that they can and will exercise it I am sure. I do not mean that modern philosophical poets and modern philosophical moralists are to come and relate for us, in express terms, the results of

[1] *Iliad*, xxiv. 49. [Author's note.]

modern scientific research to our instinct for conduct, our instinct for beauty. But I mean that we shall find, as a matter of experience, if we know the best that has been thought and uttered in the world, we shall find that the art and poetry and eloquence of men who lived, perhaps, long ago, who had the most limited natural knowledge, who had the most erroneous conceptions about many important matters, we shall find that this art, and poetry, and eloquence, have in fact not only the power of refreshing and delighting us, they have also the power,—such is the strength and worth, in essentials, of their authors' criticism of life,—they have a fortifying, and elevating, and quickening, and suggestive power, capable of wonderfully helping us to relate the results of modern science to our need for conduct, our need for beauty. Homer's conceptions of the physical universe were, I imagine, grotesque; but really, under the shock of hearing from modern science that "the world is not subordinated to man's use, and that man is not the cynosure of things terrestrial," I could, for my own part, desire no better comfort than Homer's line which I quoted just now,

τλητὸν γὰρ Μοῖραι θυμὸν θέσαν ἀνθρώποισιν—

"for an enduring heart have the destinies appointed to the children of men"!

And the more that men's minds are cleared, the more that the results of science are frankly accepted, the more that poetry and eloquence come to be received and studied as what in truth they really are,—the criticism of life by gifted men, alive and active with extraordinary power at an unusual number of points;—so much the more will the value of humane letters, and of art also, which is an utterance having a like kind of power with theirs, be felt and acknowledged, and their place in education be secured.

Let us therefore, all of us, avoid indeed as much as possible any invidious comparison between the merits of humane letters, as means of education, and the merits of the natural sciences. But when some President of a Section for Mechanical Science insists on making the comparison, and tells us that "he who in his training has substituted literature and history for natural science has chosen the less useful alternative," let us make answer to him that the student of humane letters only, will, at least, know also the great general conceptions brought in by modern physical science; for science, as Professor Huxley says, forces them upon us all. But the student of the natural sciences only, will, by our very hypothesis, know nothing of humane letters; not to mention that in setting himself to be perpetually accumulating natural knowledge, he sets himself to do what

only specialists have in general the gift for doing genially. And so he will probably be unsatisfied, or at any rate incomplete, and even more incomplete than the student of humane letters only.

I once mentioned in a school-report, how a young man in one of our English training colleges having to paraphrase the passage in *Macbeth* beginning,

> Can'st thou not minister to a mind diseased?

turned this line into, "Can you not wait upon the lunatic?" And I remarked what a curious state of things it would be, if every pupil of our national schools knew, let us say, that the moon is two thousand one hundred and sixty miles in diameter, and thought at the same time that a good paraphrase for

> Can'st thou not minister to a mind diseased?

was, "Can you not wait upon the lunatic?" If one is driven to choose, I think I would rather have a young person ignorant about the moon's diameter, but aware that "Can you not wait upon the lunatic?" is bad, than a young person whose education had been such as to manage things the other way.

Or to go higher than the pupils of our national schools. I have in my mind's eye a member of

our British Parliament who comes to travel here in America, who afterwards relates his travels, and who shows a really masterly knowledge of the geology of this great country and of its mining capabilities, but who ends by gravely suggesting that the United States should borrow a prince from our Royal Family, and should make him their king, and should create a House of Lords of great landed proprietors after the pattern of ours; and then America, he thinks, would have her future happily and perfectly secured. Surely, in this case, the President of the Section for Mechanical Science would himself hardly say that our member of Parliament, by concentrating himself upon geology and mineralogy, and so on, and not attending to literature and history, had "chosen the more useful alternative."

If then there is to be separation and option between humane letters on the one hand, and the natural sciences on the other, the great majority of mankind, all who have not exceptional and overpowering aptitudes for the study of nature, would do well, I cannot but think, to choose to be educated in humane letters rather than in the natural sciences. Letters will call out their being at more points, will make them live more.

I said that before I ended I would just touch on the question of classical education, and I will keep my word. Even if literature is to retain a

large place in our education, yet Latin and Greek, say the friends of progress, will certainly have to go. Greek is the grand offender in the eyes of these gentlemen. The attackers of the established course of study think that against Greek, at any rate, they have irresistible arguments. Literature may perhaps be needed in education, they say; but why on earth should it be Greek literature? Why not French or German? Nay, "has not an Englishman models in his own literature of every kind of excellence?" As before, it is not on any weak pleadings of my own that I rely for convincing the gainsayers; it is on the constitution of human nature itself, and on the instinct of self-preservation in humanity. The instinct for beauty is set in human nature, as surely as the instinct for knowledge is set there, or the instinct for conduct. If the instinct for beauty is served by Greek literature and art as it is served by no other literature and art, we may trust to the instinct of self-preservation in humanity for keeping Greek as part of our culture. We may trust to it for even making the study of Greek more prevalent than it is now. Greek will come, I hope, some day to be studied more rationally than at present; but it will be increasingly studied as men increasingly feel the need in them for beauty, and how powerfully Greek art and Greek literature can serve this need. Women will

again study Greek, as Lady Jane Grey did; I believe that in that chain of forts, with which the fair host of the Amazons are now engirdling our English universities, I find that here in America, in colleges like Smith College in Massachusetts, and Vassar College in the State of New York, and in the happy families of the mixed universities out West, they are studying it already.

Defuit una mihi symmetria prisca,—"The antique symmetry was the one thing wanting to me," said Leonardo da Vinci; and he was an Italian. I will not presume to speak for the Americans, but I am sure that, in the Englishman, the want of this admirable symmetry of the Greeks is a thousand times more great and crying than in any Italian. The results of the want show themselves most glaringly, perhaps, in our architecture, but they show themselves, also, in all our art. *Fit details strictly combined, in view of a large general result nobly conceived;* that is just the beautiful *symmetria prisca* of the Greeks, and it is just where we English fail, where all our art fails. Striking ideas we have, and well-executed details we have; but that high symmetry which, with satisfying and delightful effect, combines them, we seldom or never have. The glorious beauty of the Acropolis at Athens did not come from single fine things stuck about on that hill, a statue here, a gateway there;—no, it arose from all things

being perfectly combined for a supreme total effect. What must not an Englishman feel about our deficiencies in this respect, as the sense for beauty, whereof this symmetry is an essential element, awakens and strengthens within him! what will not one day be his respect and desire for Greece and its *symmetria prisca*, when the scales drop from his eyes as he walks the London streets, and he sees such a lesson in meanness as the Strand, for instance, in its true deformity! But here we are coming to our friend Mr. Ruskin's province, and I will not intrude upon it, for he is its very sufficient guardian.

And so we at last find, it seems, we find flowing in favor of the humanities the natural and necessary stream of things, which seemed against them when we started. The "hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits," this good fellow carried hidden in his nature, apparently, something destined to develop into a necessity for humane letters. Nay, more; we seem finally to be even led to the further conclusion that our hairy ancestor carried in his nature, also, a necessity for Greek.

And therefore, to say the truth, I cannot really think that humane letters are in much actual danger of being thrust out from their leading place in education, in spite of the array of authorities against them at this moment. So long as human

nature is what it is, their attractions will remain irresistible. As with Greek, so with letters generally: they will some day come, we may hope, to be studied more rationally, but they will not lose their place. What will happen will rather be that there will be crowded into education other matters besides, far too many; there will be, perhaps, a period of unsettlement and confusion and false tendency; but letters will not in the end lose their leading place. If they lose it for a time, they will get it back again. We shall be brought back to them by our wants and aspirations. And a poor humanist may possess his soul in patience, neither strive nor cry, admit the energy and brilliancy of the partisans of physical science, and their present favor with the public, to be far greater than his own, and still have a happy faith that the nature of things works silently on behalf of the studies which he loves, and that, while we shall all have to acquaint ourselves with the great results reached by modern science, and to give ourselves as much training in its disciplines as we can conveniently carry, yet the majority of men will always require humane letters; and so much the more, as they have the more and the greater results of science to relate to the need in man for conduct, and to the need in him for beauty.

THE STUDY OF ART[1]

JOHN CAIRD

Last year, as some of you may remember, I called your attention to the fact that, amongst the many projected improvements in our University system, one of the most important is the foundation, if not of a School, at least of a Chair of History, and I took occasion to make some remarks on the nature and uses of the study of history. Another and in some respects not less important branch of study is equally conspicuous by its absence from our curriculum. In the sister University of Edinburgh there exists a Chair of the Fine Arts, and also a Chair specially devoted to one of these Arts, that of Music. Here, though the study of Art has a special bearing on many of those industries to which Glasgow owes its wealth, and though there are many indications that in this great community the love of Art and Song is not an extinct or undeveloped susceptibility, we have not hitherto been so highly favored. In selecting, therefore, a topic for the present

[1] An address delivered to the University of Glasgow on November 6, 1886.

address, I have thought that, partly because it might serve to draw attention to this gap in our educational system, partly because of the interest of the subject in itself, I could do nothing better than offer you a few remarks on the study of Art.

If the higher education ought to embrace all departments of human culture, there is besides science, philosophy, languages and literatures—besides those studies which are already included in our University curriculum—one other important department which should not be ignored, viz., that which is somewhat vaguely designated by the word "art." The study of nature is not exhausted when it has been viewed in those aspects of which the scientific investigator takes cognizance. Through the forms, colors, sounds of the material world certain intuitions and emotions are awakened in us which pertain strictly, neither to the intellectual nor the moral, but to what we term the æsthetic side of our nature. And in minds of special susceptibility these ideas and emotions crave for expression in a class of works capable of calling forth kindred thoughts and feelings in those who contemplate them. In the productions of the great masters of the plastic, pictorial, and other arts are embodied ideas and experiences of an altogether peculiar kind, appealing in a special way to our capacities of admiration, tenderness, aspiration, awe; touching the springs

of passionate and pathetic emotion within the breast, and capable of lifting us above ourselves and the conditions of our common life into an ideal world of beauty, which has an existence not less true than what we call the real world for those who have the power to perceive it.

But when we claim for art a place in our scheme of education, it must be admitted that the function of education with reference to art is subject to one obvious limitation which does not apply to the other branches of knowledge. Languages, science, philosophy, history, can be taught by experts, and, with ordinary diligence, every fairly intelligent pupil can become a proficient in them; but no amount of culture, no intellectual application however unwearied, can make a man an artist. Proficiency in this case involves an element which the best cultivation cannot communicate. There is indeed a part, and that a necessary part, of the artist's equipment which can be taught and acquired. To draw, paint, model, to be master of the various methods of execution in the pictorial and plastic arts, are not accomplishments which come by nature or can be attained without long and patient study and practice. Betwixt the fine arts and the industrial arts, there is a wide gap, but they agree in this, that it requires a long and laborious apprenticeship before the learner can become a skilled artificer. The tech-

nical skill, for example, which is involved in the reproduction by the landscape painter on his canvas of the facts of form, of light and shade, of color local and reflected, of arrangement and grouping of objects so as to give unity of effect, is so great, implies the knowledge of conditions so many, so subtle and delicate, that it can be fully appreciated only by a critic who is himself an expert in the art he criticizes. So large an element of success does this technical part of an artist's equipment constitute, that it is apt to assume in the view of experts an exaggerated importance, if not to become the sole criterion of merit. The scorn of popular and uninstructed judgment amongst artists and connoisseurs, and the tendency of art-criticism to become a sort of esoteric mystery, turning on special knowledge and expressing itself in technical jargon, is due to the fact that success in art does imply, as much as success in mathematics or chemistry, a special knowledge and a special skill in the application of it, which can only be attained by severe intellectual toil. Nevertheless they *can* be attained, and they require in order to their attainment qualities and aptitudes no more rare or exceptional than those which are possessed by the average student in other lines of culture. If this were all, there would be no reason why art should not rank with the other departments of academic

culture, or why a college should not turn out poets, painters, musicians, sculptors, just as it produces scholars, doctors, lawyers, divines, in regular and sufficient supply to meet the world's demand for them.

But the difficulty of making art a branch of academic culture is that it presupposes in the pupil a capacity which is not universal, or rather which is so rare as to be practically arbitrary. Poets are not manufactured articles. No methodical discipline, however severe and prolonged, can communicate to the spirit that spark of heaven's fire which transforms talent into genius, and endows intelligence with that nameless, indefinable insight and productive power which is the prerogative of the genuine artist.

In the case of other professions, the function of education is a very comprehensive one, because there is room in these professions for practitioners of almost every order of intellect above the lowest. The world's work would not be done, the demand would far exceed the supply, if it did not content itself often with second or third-rate lawyers, physicians, preachers, etc. But the peculiarity of the artistic vocation is that there is no use in it for mediocrity. Houses to live in, raiment to wear, we all must have, and if we cannot afford to pay for the best, we must needs be content with an inferior and cheaper article. But the world has

no need for second-rate poems or pictures. It would not be physically or mentally a loser, if all the producers of such articles turned their attention to an honest trade. The soul of man is not rendered in any sense richer by reading doggerel verse or looking at vulgar portraits and feeble or indifferent attempts at figure or landscape painting. Inferior technique it may well afford to pardon, if one touch of genius inspires its product. The simplest song or ballad that has in it the ring of genuine inspiration, the rudest wood-cut in which a touch of imaginative feeling or inventive power can be discerned, the roughly-wrought clay cup or vase in whose form and modelling a genuine instinct for beauty can be traced—these and the like constitute a real addition, however slight, to the world's spiritual wealth. But, to make it such, some scintillation of the higher incommunicable element it must possess. And if elimination could be made of all productions which are absolutely destitute of it, if a holocaust could be made of all the vast accumulated lumber of bad or indifferent poems, paintings, and other so-called books of art that occupy space on this globe at the present moment, it is far less than the whole truth to say that the world would be no loser by the catastrophe.

If then there be any truth in these remarks, how can we claim for art a place amongst the

other branches of academic culture? If all that can be taught is the technical part, skill in the use of the tools of art (and this, of course, it is not the province of a University to teach), and if the indispensable qualification for the vocation of an artist is one which instruction can never communicate, is not this tantamount to saying that art-culture is incapable of becoming an element of the higher education? In answer to this question, I shall ask your attention to one or two observations on the possibility and uses of the study of art.

I. In the first place, it is to be observed that, though education cannot make men artists, it may help most men to enjoy and appreciate works of art. It is not inconsistent with what I have said to maintain that, though the power to produce may be rare, the power to relish is all but universal. Perhaps, indeed, careful reflection might suggest doubt as to any hard and fast distinction such as I have just referred to between the higher and lower orders of mind. At any rate, it cannot be questioned that the power to recognize and respond to what is true or beautiful in the products of human thought may be possessed by multitudes who are destitute of the power to create or originate them.

In philosophy and science the men who stand peerless for speculative power or for capacity

to penetrate the arcana of nature have been few, but thousands in their own and every successive age have grasped their ideas, apprehended and verified the discoveries they brought to light. The immortal masters of art and song whose names live for ever on the roll of fame it would not take long to count, but the very greatness their names have attained has arisen from the fact that they spoke to feelings and intuitions that are universal. They would have had no power to charm and thrill the minds of men, if they had not interpreted them to themselves, if there were no slumbering element in the human soul which they had the capacity to awake, no dim, inarticulate thoughts and emotions for which they found a voice. The secret of their world-wide undying empire lay in this, that the living fire of their genius found a fuel of its own waiting to be kindled in the common heart, that the creative imagination in them spoke to a dormant imagination which it elicited and developed in the mind and spirit of humanity.

On this point I cannot dwell further than to say, that human experience is full of indications of what I may call the universality of the art-instinct. The capacity to appreciate the higher kinds of art may be the privilege of the initiated, but even amongst the ignorant and uneducated, and at the earliest stages of human progress, the art-instinct, —rude, untutored, blind, it may be,—manifests its

presence. The faculty to which art appeals, the pictorial and poetic imagination, the power to glorify the hard, external facts of outward experience, and to create out of the forms of sense an ideal world of wonder and delight, quickens within the mind at the first dawnings of intelligence. The rough discipline of life may all too soon extinguish the idealizing impulse, but there is a sense in which it may be said that every child is an unconscious poet and artist, and that song comes earlier than articulate speech. In its moment of exuberant joyfulness, disporting itself in summer hours amidst flowers and sunshine, you will hear the child crooning to itself a low murmur of baby music that gives vent to emotions for which it has as yet no other medium of expression. We know, too, how vivid is the idealizing faculty in childhood—its capacity to infuse vitality and consciousness into the lifeless objects that surround it, to work up with a kind of incipient dramatic instinct little scenes and plots out of the barest materials; and how, as it wanders by wood and stream, prattles to the running brook, apostrophizes the sunbeam or runs to catch the flying shadow, it can create for itself a little world of imagination that will charm it for hours and days into forgetfulness of the real world in which it lives.

And the same thing is true of the infancy of

the race, and of the undeveloped intelligence at all stages of civilization. Wherever men attempt to rise above mere utility and make some effort, however feeble, to adorn and beautify life, the art-instinct betrays itself. The savage who tattooes his limbs, stains his person with streaks of color or decorates it with feathers and shells, or carves rude imitation of animal forms on club or spear or paddle, is manifesting the germs of the same tendency which expresses itself in the delicate fabrics and harmonious colors which set off the charms of the modern beauty, in the gems which sparkle on her fingers and the jewels and flowers that adorn her hair. The buffalo or tiger-skin with which the Indian adorns his wigwam, the rude trophy constructed from the spoils of the chase which he hangs on its walls, are low developments of the same instinct which fills our modern mansions with art-treasures, our rooms and picture galleries with the masterpieces of painting or sculpture.

Racial peculiarities or historic and other conditions may keep this instinct at a low point of development, or for a time in some directions wholly suppress it. In our own country, for instance, for reasons which we need not pause to investigate, the artistic side of our nature, so far as the pictorial and plastic arts are concerned, has, till lately, only feebly and rarely manifested itself; but other expressions of its presence have not been

lacking. As one amongst ourselves,[1] following in the footsteps of Walter Scott, and with a kindred sympathetic insight into the nobler elements of the Scottish character, has taught us, in the ballads and songs, the folk-lore and fairy legends of our country—simple, inartificial, naïve in form, yet instinct with the pathos and power, the yearning after the invisible and the ideal, the wonder and awe and mystery of a genuine imaginative inspiration,—in these spontaneous expressions of the genius of the Scottish people, we have the proof that amongst a rude and unlettered race, and in a social state only a slight remove from barbarism, the presence of an unmistakable sensibility for art may be found.

But in this as in other cases, instinctive feeling needs and is capable of cultivation and discipline. That which is implanted in man's nature only as an unreflecting intuition must, in order to its perfection, undergo the discipline of education. The spontaneity of nature, though sometimes and in the case of rarely gifted souls it may excel the labored productions of art, is limited in its range of achievement, and amongst ordinary men the mere natural instinct for beauty will carry them but a little way in appreciating what is really worthy of admiration. In what are called distinctively the Fine Arts an uninstructed taste is,

[1] The late Professor Veitch. [Author's note.]

in a great majority of instances, bad taste, and beyond a certain very limited range it will remain insensible, not only to what belongs to the technique of art, to skill, refinement, and subtlety of execution, to delicacy of drawing, coloring, modelling, to the things, in short, which charm the expert, but even to the inner elements of grandeur or beauty of conception, of which technical skill is only the vehicle. In the region of feeling we often indulge the thought that taste is a purely arbitrary thing, and that pleasure or delight is the only test of merit. If a man is pleased in a picture by flashy vulgarity, or coarse literalism, or weak sentimentality, or clever sleight-of-hand, at which a more refined taste shudders, he will not seldom express unhesitating commendation without a suspicion of its injustice; and, if everything rests on feeling, who is to dispute his verdict?

The answer is, that art, no more than morality or religion, is a purely subjective and arbitrary thing. Without going into the metaphysics of the subject, which is at present impossible, I venture to pronounce, that in the one case as in the others, there are principles and standards of judgment to which individual opinion must learn to bow, and that we are no more bound to accept in art the verdict of undisciplined feeling than the Christian moralist is bound to accept, as of equal validity with his own ethical judgments, the

crude moral notions of primitive times and barbarous races. What the canons of art criticism are, by what methods of instruction the educator is to proceed in developing and training to a refined and rational activity the mind and judgment of his pupil, it is not for me to pronounce. Enough, perhaps, has been said to show that there is nothing in the nature of art to render the study of it impossible as a branch of general culture.

II. But granting that art is a possible study, is it also a useful one? What benefits inward or outward is the student to gain from it? In answer to this question, I shall now say a word or two as to the uses of art as an element of human culture.

It would seem at first sight that an inquiry into the uses of art involves a contradiction in terms. What we seek in a work of art is not instruction or information, not material or other advantages, but simply pleasure or enjoyment. Music, painting, poetry, and the other fine arts, whatever they do for the embellishment or decoration of human life, obviously contribute nothing to the supply of its practical necessities. They may form the luxury of idleness or the innocent pastime of our hours of leisure, but in themselves they have no moral purpose or practical utility; and whenever pleasure clashes with profit, they may even become noxious—diverting, as they do,

time and thought from the serious work or sterner tasks of life.

Moreover, the view of the function of art which relegates it to the province of the ornamental as distinguished from the useful, seems to be sanctioned not merely by popular thought, but also by philosophic theory. Amongst those who speculate on the subject the accepted theory seems to be that which is embodied in the phrase, "Art for art's sake," meaning by that, that art is to be prosecuted for itself, and not for any ulterior end. The end of a work of art is not to point a moral or to convey a lesson in science or philosophy, or even to soften the manners and refine the habits of society; but to be, in and for itself, a source of delight. It appeals to what has been called the "play impulse" in human nature, to the spontaneous enjoyment of activities which men put forth, not for the wages they are to earn or the benefits they are to procure thereby, but simply because they find in the free play of their energies an immediate satisfaction and joy. When the sympathetic observer stands in rapt admiration before some great masterpiece of painting or sculpture, or when ear and soul yield themselves up to the charm of the great composer's art in song, cantata, opera, oratorio, and vague, undefined emotions, passionate or pathetic, are awakened within the breast, no thought of ulterior

use or profit crosses the mind. Its experience is that of absorption in present, immediate enjoyment. And, on the other hand, if we think of the attitude of the artist's mind in producing, equally foreign to it is the aim at anything beyond the work itself. He paints or sings or writes simply because the creative impulse is upon him, and he cannot choose but give it vent; because a dream of beauty has taken possession of his soul, and it is joy or rapture to him to express it.

But whilst this view of the essentially non-utilitarian character of art may be freely conceded, there is nothing inconsistent with the concession in claiming for works of art a higher function than that of recreation or amusement, or in the assertion that they contribute in no slight or inappreciable measure to the formation of character and the intellectual and moral education of the community. In making this claim, however, it must be admitted that, in one point of view, the principle of "art for art's sake" is profoundly true. The educative function of art is, at best, an indirect one. Whatever intellectual enlightenment or moral elevation is to be gained from works of imagination, to communicate such benefits cannot be the conscious aim of the artist; nor is the merit of his work to be estimated by its didactic excellencies. Bad or indifferent painting or poetry is no more redeemed from artistic inferiority by

the moral or religious aim of the author than ill-dressed food or ill-made clothes by the respectability or piety of the cook or tailor. And, on the other hand, a poem or picture may have many of the highest qualities of art, though the subject may be coarse or voluptuous, or the treatment such as to offend our moral susceptibilities.

The poetry of Shelley and Byron contains much which, from a religious or moral point of view, cannot escape censure, whilst the literary form is of the highest artistic merit. The works of Dr. Watts and Mr. Tupper are full of pious teaching and unexceptional moralizing, yet, regarded as poetry, both are execrable. The deepest truth, in short, the noblest moral lessons may be conveyed in a form of art, but it is as unconsciously, with as little of a didactic aim, as are the lessons which Nature herself is ever teaching. The teachings of rock and stream and sea, the moralities addressed to us by stars and flowers, by autumn woods and mountain solitudes, do not reach us in the form of argumentative disquisitions, but of feelings and emanations which win their way insensibly into the soul. There are better sermons in stones and in the running brooks than human pen ever indited, but the lessons which these unconsecrated preachers address to us are innocent of logic or formal admonition.

Oh, to what uses shall we put
The wild-weed flower that simply blows
And is there any moral shut
Within the bosom of the rose ?
But any man who walks the mead
In bud or blade or bloom may find,
According as his humors lead,
A meaning suited to his mind ;
And liberal applications lie
In Art, like Nature, dearest friend,
So 'twere to cramp its use if I
Should hook it to some useful end.

And the reason for what has now been said is obvious. It arises from the very nature of art as distinguished from science. Works of imagination and works of instruction may treat of common subjects. The painter may depict, the poet sing, of the same scenes, persons, events, objects, whereof the naturalist, the historian, the philosopher discourses. But the aspects in which the two sorts of observers contemplate the common objects are essentially different; nor is it possible to combine in the same work an artistic and a scientific view of a subject, without sacrificing the peculiar excellence of both. In proportion to its merits as a work of science it will be bad as a work of art, and the very qualities which make it good art will make it bad science. The same tract of country, to take a palpable illustration, may be represented in landscape painting and in a map. But the painter who tried to embody in his

work the precise and definite information of the map, would make it a wretchedly bad picture, and the geographer would spoil his map, if he tried to introduce the artistic effects of light and shade into his delineation of the boundaries of countries and of mountains, rivers, and streams. An anatomical drawing or model and a figure in sculpture deal both with the human frame; but if the sculptor is moved by the desire to display his anatomical knowledge, the ineffable grace and beauty we demand in a work of art vanishes, and what we get is neither science nor art, but only artistic pedantry. Or, to take but one other example, the conflicting and essentially inconsistent aims of science and art are exemplified in so-called didactic poems and novels with a purpose. A novel, say, may be written to illustrate some theory of life or to expose some social or political abuse—the evils of intemperance, the bad effects of the land or marriage laws, or what not. But what will be the inevitable result? The writer may be in the structure of his mind either mainly artist or mainly theorist. If the art-instinct predominates, there will be a constant temptation to sacrifice the didactic purpose to the exigencies of artistic treatment. Whenever the effective development of the plot would be marred by a too copious introduction of facts or a strict adherence to theory, the art impulse triumphs and

fact or theory are ruthlessly sacrificed. If, on the contrary, the writer is too conscientiously bent on the communication of information or the advocacy of a doctrine to care punctiliously for artistic effect, the result is a nondescript performance which gives neither information nor delight.

Though, however, it is not the direct function of art to teach, yet it does teach. Without direct scientific or ethical aim, works of imagination are not only the means of purest enjoyment, but they convey to us an order of ideas of an altogether peculiar kind, reveal to us in nature and in human life much which it lies beyond the province of science or philosophy to disclose, and exert over the moral nature an elevating and ennobling influence, in some respects the more potent that it is not their direct purpose to produce it.

What then, let me ask, is the sort of teaching which it is the unconscious vocation of art to communicate, what is the peculiar class of ideas of which works of imagination, in distinction from all other productions of human thought, are the vehicles? The answer to this question may be summarily given by saying that it is the office of art to idealize nature and life, or to present their facts and phenomena in their ideal aspect.

Does this answer mean that human art can improve on nature as God made it, or on human

life as Providence has ordered it? Can the loftiest genius invent a fairer world, can the most soaring imagination conceive, or the resources of art depict, forms more lovely, lights more dazzling, harmonies of tone and color more subtle and various than those which we have but to open our eyes to behold? Bring before your minds, for example, any one of nature's ever-changing aspects, and say if the attempt faithfully to render it would not be employment sufficient for the rarest skill of the most ambitious limner who ever handled brush and palette? Light softly tinting the mountain edge at morning, or flooding meadow and woodland and stream with the golden rain of noontide, or flinging abroad with munificence of departing greatness its treasures of purple and vermilion and gold, ere it passes away with infinite gradations of fading splendor beneath the western horizon; the sea rippling up with gentle, scarce perceptible insinuation over the long reaches of the pebbly shore, or rushing with wild impetuosity and hoarse clang of assault on the cliffs of an iron-bound coast; a mountain lake "in the light of the rising moon and of the first stars twinkling against the dusky silverness of twilight":—what, it may be said, has human art to do with its own inventions when, in myriads of such scenes and aspects, with inexhaustible wealth of loveliness, nature awaits, yet baffles

man's utmost skill to copy her? Nay, before he presumes to draw on the resources of his own imagination, let the artist take the commonest natural objects, the merest patch of earth or sea or sky—a pool, a spray of hawthorn, a clump of heather, a cloud floating on the summer sky—and say, whether, after his most patient and protracted toil, he has succeeded in reproducing an exhaustive representation of what is before his eyes?

To this the answer is that, even if it were true that the artist has no other function than to record what he sees in nature, it is not every eye that can see what he sees. Nature reflects herself in the mirror of man's mind, but the mirror in most cases is opaque or dim, sometimes distorted and fractured, and the reflection takes its character from the medium by which it is produced. For the scientific man the outward facts, confused, accidental, unordered, which are all that the ordinary observer perceives, become luminous with the presence of hidden laws and relations. For the artistic or poetic observer, for the mind that is in sympathy with the soul of things—sensuous forms, colors, motions, are alive with the spirit of beauty, transfigured with the hidden glow and splendor of a light that other eyes see not—a light that never was on land or sea. And it is his high vocation, not merely to copy, to

tickle our imitative susceptibilities by a matter-of-fact imitation of what we saw before, but through the language of imagination to interpret nature, and make us look upon her face "with larger, other eyes than ours."

But we may go further than this, and boldly say that there is a sense in which art does "improve on nature." All art that is worthy of the name is creative, calls into existence something more than the bare facts which the outward world offers to the senses. These are the materials on which it works, but it does not leave them unchanged. It takes them up, pours them, so to speak, into the crucible of imagination, flings aside the mere dross of accident, fuses them anew in the fire of thought and feeling, shapes and moulds them into conformity with its own ideals, and, lo! from its creative hand, forms which eye hath not seen, embodied visions of a land that is very far off, and of which only in our most exalted moments we catch a glimpse, start into life and beauty.

That there is nothing presumptuous in thus claiming for the imaginative arts the power to add something to nature, we may see by reflecting on what takes place even in the domain of what are called the industrial arts. Every piece of mechanism has in it something more and higher than nature contains. Watches, locomotives,

power-looms, steam engines, are not mere natural products. They derive their materials from nature, they take advantage of natural forces and laws, but in their production a new, commanding, selecting, transforming element comes into play, compelling nature's raw materials into new combinations, itself the supreme force amidst nature's forces, to wit, the element of thought, the idea or conception of the inventor. And in like manner in that which we call by eminence the realm of art, *i.e.* everything is based on nature and must, in a sense, be true to her; but that which constitutes the most precious element in the great work of art, that which arrests and holds the appreciative mind, is not nature slavishly copied, literally, mechanically reproduced, but the idea, the inspiring thought, the soul of the artist speaking to our soul and causing nature to shine for us with a supernatural significance and glory.

It is of course true that there is a kind of art which possesses nothing of this ideal element; and that, as there are uninspired day-laborers in art who can, at most, by technical skill produce mechanical copies of common facts and incidents, so there are innumerable patrons of art of the same order, in whose eyes vulgar imitation is the highest or only criterion of merit. But the highest praise which such productions deserve is that, at most, of clever mimetic legerdemain. They

come no nearer to true art than the feats of the ventriloquist to eloquence, or the representations of political and other celebrities in Madame Tussaud's gallery [1] to sculpture.

Who amongst us cannot recall hundreds of exact, speaking likenesses of nobodies, prosaically accurate as the armchairs on which they sit, or the official robes with which they are bedecked—portraits of which the best that can be said is that the subject and the limner were worthy of each other? And to see what true art can do, compare the wooden fidelity of such productions with the relation which a characteristic portrait of a man, worthy of a great painter's powers, bears to the actual fleshly form and features of the subject. Here you have no reproduction of facts as you could measure them by rule and compass. A thousand irrelevant details that would only mislead and distract are left out. What is most significant of the soul and spirit is disengaged from what is purely arbitrary. What belongs to the inner essence of the man is so grasped and rendered that all that meets the eye—look, attitude, action, expression—is instinct with meaning, and everything else is subordinated to that in which the man was most himself, and which made him the special individuality he was. Of

[1] A well-known gallery in London, devoted to the exhibition of waxworks.

a work which thus fulfils the conditions of true art it may be said that in it the subject stands revealed to us more clearly than in his actual presence the common eye could discern him. Its power to evoke reality is like that which our greatest poet ascribes to memory recalling the image of a dear face and form we see no more:

> The idea of her life shall sweetly creep
> Into his study of imagination ;
> And every lovely organ of her life
> Shall come apparelled in more precious habit,
> More moving delicate and full of life,
> Into the eye and prospect of his soul
> Than when she lived indeed.

And this leads me to add, lastly, that it is the function of art to idealize not only nature but human life; and it is by the highest of all arts, poetry, and that which differs from poetry only in form, prose fiction, that this function can best be fulfilled. What a characteristic portrait is to an individual a great epic poem may be said to be to the life of a nation or the spirit of an age. A great dramatic poem or work of prose fiction, by the selection of its characters, actions, events, by the elimination of what is accidental and irrelevant to the main design or motive, by the evolution of the plot and the gradual and natural movement towards the dénouement, compresses into brief compass an ideal of the moral life of man which

no literal record of facts could convey. Here, too, realism is not art, or at best only an inferior kind of art, and it is only by the presence of the ideal element that the profoundest truth can be obtained.

No writer can reproduce the whole of human existence or more than a very limited part of it within the brief compass of a drama or story. To give us a representation of life, all that a writer can do is either to copy a small bit of it with minute and painstaking fidelity, to tear out a leaf or two from the book of human life, so that we shall have it line for line and letter for letter—and this is the method of realistic fiction; or, instead of a fac-simile of a portion of human experience, he may try to make his work a representation on a small scale of what he conceives to be its significance as a whole, or at least of the hidden moral meaning of some phase or section of it. From the innumerable phenomena in their confusion and complexity of aspect as they appear to the ordinary observer, he can pick out a limited number of characters and incidents, giving relief to some, throwing others into the shade or rejecting them as mere surplusage, and group, arrange, order what is left, so as to convey to the reader some idea of the unity, the harmony, the moral significance of the whole. And this obviously is a task which, though it admits

of infinite varieties of excellence, implies, in order to its worthy fulfilment, powers of the very highest order, a mind that is not merely observant but creative or poetic,—a capacity, in other words, not simply of reflecting what lies on the surface, but of seeing under it and getting at the heart of life's mystery—a capacity of taking up the scattered materials of experience and fusing them in the fire of imagination into a new organic whole, every element in which is full of significance.

It is true that realism often implies no common gifts. It needs powers of observation and graphic delineation, such as few possess, to produce a vivid picture of even the superficial aspects of life. It is no despicable talent which enables a man to catch up and arrest the evanescent, fugitive play of light and shade on the surface of society, to reflect in fixed colors the light flow and ripple of its follies, its vanities, its absurdities, or to portray without exaggeration its vulgarity, its meanness, its baseness. Yet with all the talent displayed in popular realistic fiction of the last and present centuries, it may be questioned whether the result even at the best is one to which the honor of true art can be ascribed. Truthfulness and reality are great qualities in an artist, but the realism that copies the surface only is often more untrue to nature than the wildest vagaries of fancy. Verisimilitude that is faithful only to the

outside is not seldom as deceptive as downright falsehood. The life of clubs and drawing rooms, of gossip, flirtation, and match-making, of dining and dressing, of flippant talk and conventional manners—this, even among those whom its purports to represent, is not the true life of men and women, even the meanest of them. If it were, so far from laboriously recording, it were better for us in shame and sorrow to ignore and forget it. And the same is true of the realistic novel of low life. The literalism, however clever, is surely unprofitable, which invites us to occupy time and thought with minute and wearisome details of the dress, the surroundings, the food, the manner of speech, of the dwellers in London back lanes and hovels—with the slang of costermongers and the chaff of omnibus-drivers, with inventories of the furniture of the tap-room or of the articles on the shelves of the pawnbroker's shop.

In contrast with this crude realism, it is the function of the true artist so to represent life as to enable us to penetrate beneath its superficial aspects, and to perceive the grandeur that is hid under its apparent meanness, the good that lies at the basis of its seeming evil. Life is not really for any of us the poor, bare, barren thing it often seems. A treasure of beauty and joy of which we often wot not lies scattered about our daily path. Its dulness, its monotony and lack

of interest, arise only from ignorance of the deeper forces that are at work underneath it. Its hardness and unloveliness are but the veil of a strange beauty which is ever ready to be revealed. It needs but the insight of the master-mind to see, and the touch of the master-hand to disclose, the wonder and greatness that are often latent in its homeliest details—all the passion and the power, the pathos and tenderness, the often more than tragic interest with which our common life is replete. Materials for art, subjects for song or story, if he can but detect and disentangle them, lie ready to the true artist's hand. Under a thousand varieties of forms and circumstance the essential greatness, the boundless possibilities of man's nature, the obstacles which resist and the strength of will which makes him master of his destiny, the struggle of duty with necessity, the collisions and conflicts, the play and strife of the great normal passions by which character and happiness are made or marred, the unsounded depths of sorrow and joy which human hearts contain, the golden threads of love and charity and truth and tenderness that are woven into every human life, and the sweet wonders of the common earth and skies which encompass it—these things constitute the materials which make human life an inexhaustible field for the sympathetic insight and inventive power of art.

So long as man's life is what it is, the strange story of "a being breathing thoughtful breath, a traveller 'twixt life and death," so long as, in innumerable ever-varied aspects, the moral elements of love and sorrow and hope and disappointment, of short-lived raptures and enduring cares, of temptations issuing in the strength of conquest or the weakness of discomfiture—the wondrous medley of greatness and littleness, of things mundane and things celestial, of contrasts that move, now our laughter at their incongruity, now our terror at their awfulness—in one word, the strange swift course run out beneath the silent heavens, with the shadow of the awful future creeping ever more near till we are lost in its impenetrable mystery—so long as life contains such elements, the mind that can strip away the mask of accident that conceals them and by the power of genius vividly reflect them, will find in it scope for the grandest efforts of imagination, and such minds will be numbered among the wisest teachers of mankind.

FIRST PRINCIPLES[1]

GEORGE EDWARD WOODBERRY

Literature is an art of expression. The material which it employs is experience; or, in other words, literature is the expression of life. Action, emotion, and thought are the three great divisions of life, and constitute experience. Literature undertakes to represent such experience through the medium of language, and to bring it home to the understanding of the reader. It is obvious that literature makes its appeal to the individual mind and is intelligible only in so far as the individual is able to comprehend its language and interpret the experience there embedded. A good reader is an author's best fortune, for the writer strives in vain unless he be understood. The reader's own experience is the key to literature. It may be direct experience, events and passions personal to himself; or it may be indirect, events and passions observed in the career of others, or at least learned by report; but in any case the power to under-

[1] Reprinted through the generous permission of Doubleday, Page and Company, from *The Appreciation of Literature*, by George E. Woodberry.

stand indirect experience, that is, experience not one's own, depends on the existence of a common human nature and on the share of it which the reader has already realized in his own life and self-consciousness. It is by sympathy and imagination that one enters into the lives and fortunes of others; and these two faculties, which are the great interpretative powers of literature, have richness, strength, and scope in proportion to the quality and quantity of individual experience, to the depth and range of one's own life. Sympathy and imagination are the faculties which literature most cultivates by exercise, and the enlightenment which literature brings is in the main achieved through them. It is plain that the appreciation of literature is a continuing process, and depends on increase of experience in the personal life, and on growth of the imaginative and sympathetic powers; hence it is changeable in taste and standard, and varies from one stage of life to another. It is a measure of growth because it proceeds from growth; to love the poets is a certificate of manhood, a proof that one has put forth the powers and appropriated the means of life, that one is on the way at least to be humanized. Literature is the foremost of the humanities, of those instrumentalities by which man becomes more completely human; and in the individual this end is furthered in proportion as he understands human

nature in others under its various modes, and brings forth from it in himself the richest experience of its capacities. Openness to experience, or sensibility, is the prime quality of the good reader; and to this the writer adds, on the active or creative side, the power of expression through language. These two faculties are the essential constituents of literary genius. The appropriation of a work of genius is, in a certain sense, a repetition of the act of creation under different circumstances, and the good reader must share in the genius of his author in however pale a form and on however low a scale. It has long been recognized that this likeness exists between the two; for the act of reading is a blending of two souls, nor is it seldom that the reader brings the best part, vivifying his author with his own memory and aspiration, and imparting a flame to the words from his own soul. The appreciation of literature is thus by no means a simple matter; it is not the ability to read, nor even a canon of criticism and rules of admiration and censure that are required; but a live soul, full of curiosity and interest in life, sensitive to impressions, acute and subtle in reception, prompt to complete a suggestion, and always ready with the light of its own life to serve as a lamp unto its feet. Appreciation of literature, too, is neither rapid nor final; it moves with no swifter step than life itself, and

it opens, like life, always on larger horizons and other labors.

Experience, such as has been indicated, is usually found in literature in a complex form. It may be usefully discriminated as either personal, national, or universal, and in authors individually some one of these kinds is generally predominant. Byron is the type of the personal writer, interested in his own moods and fortunes, egotistic in all his life forces, creating his heroes in his own image and repeating in them his qualities, his ambitions and disillusions, giving his confession through their lips. Virgil is the most distinguished example of the national writer; one always thinks of Rome in the same breath,—"Roman Virgil," as Tennyson begins his noble tribute. Virgil set forth the specific and peculiar experience of the Roman state, giving expression to common traits and interests, the tradition and ideals and manners of the empire that had come to be out of the toil of the fathers and was then the glory of the earth. Universal experience is that which is the same for all men, whatever their race, country, or age, and is exemplified most plainly by the stories of Scripture which have had greatest currency, and in a single author most purely by Shakespeare. The scale of experience with which literature deals, in other words, begins with the narrow circle of the writer's own life and

widens out through his city, people, nation, his age, until it includes humanity as such; and in the final and simplest form this experience is of interest, not because it was one man's or one nation's, but because it may be the experience of any man put in such circumstances. Every man has this threefold ply in his life; he has that human nature which is common to the race with its unchanging passions, needs, and vicissitude of human events, and he adds to this the special traits of his age and country, which he also has in common with his fellows; and besides he possesses peculiarities of character and temperament and fortune in life in which his individuality lies. Literature corresponds to this arrangement by presenting its work similarly woven of individual, national, and universal strands, and it has more breadth of significance in proportion as it embodies experience most purely in the Shakespearian or Scriptural type. The appreciation of literature in this type is most ready, in the greatest number of cases, because a certain preparation in history or biography is necessary to the comprehension of the national and personal types. The direct appeal to experience, in other words, without the intervention of study, is made on the ground of universal life; and to this kind, by virtue of the universal element in it, the most enduring literature belongs.

To approach the matter in another way, life is infinite in the number of its phenomena, which taken together make up experience; but there is great sameness in the phenomena. The monotony of human life is one of the final and persistent impressions made upon the reader as upon the traveler. It is natural, therefore, that a love song that was merely a personal effusion of feeling sung in Persia centuries ago should seem to pour forth the genuine emotion of some lover of to-day in a far-off land, and should serve him as the verbal channel of his joy or grief. Emotion has thus prepared for it in lyric poetry of all lands a ritual already written and established. Action, likewise, whose poetic form is epic and dramatic poetry, has a literature of war and passion that passes current everywhere; and thought, the third great form of experience, which is set forth in philosophy or science, sums up its formulas of knowledge and wisdom which serve equally in all languages. The common element is so great, the limits of human experience in all its forms are so restricted, that there results this easy communication and interchange between races and ages. Literature, so built up and disseminated, while it always offers a wealth of expression for the normal and mediocre experience of life, the commonplace, nevertheless tends to prefer, in its high examples, that which is surpassing in emo-

tion, action, and thought, and to conserve this, however far beyond reality, as the mode of overflow of the human soul in its aspiration and its dream of what is possible to itself. Man is a dreamer even more than he is an actor; his actions indeed are hardly more than fragments and relics of his dreams. This is the realm of the ideal, and literature treasures there its greatest works, those which are especially regarded as its works of high genius in creative imagination. The material is still experience, and the expression sought is still the expression of life, but it is experience transformed by being newly arranged and it is life expressed rather in its function of power than in its operation of reality. This change which passes upon experience and gives scope to the soul's power is brought about by the intervention of art; for literature is not a record of experience primarily and simply, but it is an art using experience for ulterior ends.

Experience, things as they occur, the mere material of expression, is raw material, a crude agglomeration, life just as it comes to pass. If a newspaper were the complete history of a day, as a journalist once defined it, this would be an example of the expression in language of such experience; but it would not be literature, because there would have been no intervention of art in the case. The primary step in art is selection

from the crude mass of material of such parts as will serve the purpose of the writer; these parts are then combined so as to make a whole, that is, they are put in necessary relations one with another such that if any part were to be taken away the whole would fall to pieces through lack of support; a whole so constructed is said to have organic unity, the unity of an organism. This unity is the end of art, and the steps to it are selection and logical combination. This is true of the arts in general, and gave rise to Michael Angelo's well-known definition,—"art is the purgation of superfluities." In literature such construction is illustrated by the general nature of plot, which is a connection of events in the relation of cause and effect such that each is necessary to the course and issue of the action as a whole, and none superfluous. Hardly inferior to the use of plot in the field of action as an artistic resource in literature is the employment of type in the field of character; here a similar process of selection takes place in consequence of which the person, or type, possesses all the qualities common to a class of individuals and no quality peculiar to any one individual; this is ideal character. Thus Romeo is all a lover, Achilles all a hero, Iago all a villain. Ideal character, or type, and ideal action, or plot, are the two great modes of creative art in imaginative literature; but there are be-

sides many other artistic means employed by literature in its representation of life. These two serve sufficiently to illustrate the use of art made by literature, which is to clarify the experience which is its material; thus plot rationalizes events under the law of cause and effect, and type simplifies character by presenting it under a single and immutable aspect, or by restricting attention to a few phases of it within a narrow range. Without entering on the mazes of æsthetic theory, where there is little certainty, it is enough to observe that art in general seeks order in life and obtains it by process of segregation and recombination, whether the order so found be something plucked from the chaos of nature and revealed as an inner harmony of the universe, or be merely the grace flowing from man upon the world and the illusion of his limiting intelligence. The presence of this order in art is plain; and also the principle of clarification, of simplification, of economy in the interest of an intelligible and comprehensive conception of experience, operating to disclose this order, is likewise to be observed. Whatever may be the validity of art, in the philosophic sense, what is essential here is the simple fact of its presence as the mode by which literature deals with experience in order to draw from life its use and meaning for men. The conclusion is that literature represents life in certain formal ways; a

degree of formalism is indeed inseparable from literature, as from all the other arts, and some acquaintance with its traditionary forms is indispensable to the appreciation of its contents, while, besides, the pleasure of the forms themselves is a part of its real value. The importance of the formal side of literature is not lessened by the fact that the perception of form and delight in it are not English traits in a high degree; in this respect the southern nations excel the northern peoples by far; it is probable, indeed, that for the English generally, in approaching their literature, there is a sense of artificiality in the mere form of verse greater than they feel in the case of a picture or a statue. The external form, which is generally described as technique, is really no more artificial than the internal form, which consists in the development of the theme independently of its melodic investiture; neither is truly artificial, but both belong under artistic formalism, which is the method whereby great imaginative literature takes body and acquires its intense and enduring life.

In correspondence with the three kinds of experience, personal, national, and universal, each recreated in artistic form, there are three modes of critical approach to literature in order to interpret and understand its contents. The first and simplest is the purely æsthetic, and is especially

applicable to universal literature; it looks only at the work, which is freed from conditions of time and place and origin, analyzes its qualities, compares it with others, classifies, and so judges it under formal criteria by itself alone and for its own sake as an incarnation of that human life, an expression of that human spirit which is the same yesterday, to-day, and forever, at least within the range of the arc which art has thus far measured; it is this sameness in the soul, as interpreted by art, which justifies the absolute nature of this mode of criticism. The second is the purely historical mode of approach, and is appropriate to the national element in experience and the works which most embody it in whatever form; it looks at the environment, examines race, country, and epoch, and seeks to understand the work as merely the result of general social forces and broad conditions and as the necessary and, as it were, fatal expression of these, and allows the least possible part to individual choice or influence. The third mode, which is more proper to the personal element, is the psychological; it looks at the personality of the writer and seeks to interpret his work as the result and expression of his peculiar temperament and faculty under the personal conditions of his birth, education, and opportunities. All three are useful methods and are alike indispensable; and as literature normally

presents the three kinds of experience blended, and seldom singly in a pure form, it is generally necessary to employ the three kinds of criticism, without giving undue advantage to any one of them, in order to grasp any great work fully in its personality, its historical significance, and its universal and imperishable æsthetic value. It is nevertheless true that mere biography and mere history are not, properly speaking, literary elements, when literature is regarded as a fine art; they are adjuncts to the interpretation of the work just as grammar may be, or archæology, or any other subsidiary aid; but the characteristic value of any literary work, that which makes it literature, is independent of these and is a more vital and enduring thing. This value lies in its being a work of art.

The critical approach to literature, by whatever mode, implies study, an acquired knowledge of biography or history or of artistic forms. The direct aim of all art, however, is to please, and to please immediately; study may be a part of the necessary preparation for appreciation, but it does not enter into the appreciation itself. It is useful to recognize at once the fact that literature is not an object of study, but a mode of pleasure; it is not a thing to be known merely like science, but to be lived. If a book does not yield immediate pleasure to the reader, as direct

and intimate as sensation or emotion, it fails with that particular person to discharge the proper function of literature. The typical example of the operation of literature is found in the company of warriors listening to the old minstrel who relates the heroic deeds and tragic histories that make up the tradition of the tribe, or in the groups in the mediæval marketplace who hung on the lips of the traveler telling tales, the poet chanting lays, or the players representing in rude scenes the comedy of human life. This is not to say that the hearer is without some preparation, but not that of study. Even the simplest books, such as those about nature, require that there should have been in the reader some previous life, some training of the eye, some curiosity about birds and beasts and the treasure-trove of the seabeach. The having lived is the essential condition of any appreciation; or, in other words, the appeal to experience, lies back of all literary pleasure. The more direct this is, the better; and literature rises in the scale of value in proportion as the appeal is made to broader and wider experience, to more and more of life already realized in the reader himself. His life with nature must be wide and deep before he can appreciate formally and easily the greater works of poetic imagination in which nature is employed as the channel of high passion, as the symbol of philosophic truth, or even as

the harmonious and enhancing environment of scenes of love or tragedy. That reader does best who in his use of literature insists on the presence of this immediate appeal to himself in the books he reads. If the book does not have this effect with him, if it does not coöperate with his own taste and interest, it may be the best of books for others, but it is not for him,—at least it is not yet for him. Study, the conscious preparation to understand, begins when the difficulty of appreciation becomes insurmountable by private and personal experience. The obstacle is, in the main, merely a defect in experience such as to impair his powers of imagination and sympathy which interpret other lives and experience not his own to himself. This obstacle rises especially in past literature, and it increases in proportion to the antiquity or foreignness of the literature, in general, in the degree to which the literature involves different conditions of life from those which are contemporary. It is here that scholarship of all sorts has its function in the endeavor to make contemporary in thought the past phases of life.

The soul is essentially the same in all men; yet its temperament, its consciousness of the world and of itself, its faith and the modes of its ambition and consolation are widely different in the various races and civilizations. It is extremely difficult even for a trained and instructed imagina-

tion to realize the world of a mediæval saint or of a Greek sophist or of a Jewish enthusiast of the age of the prophets. If one attempts to reconstruct the physical aspect of such a man's thought of the heavens and the earth, and then adds, as best he can, the intellectual and moral contents of such a mind and heart, he seems moving in a world of mistake and ignorance so different from our own as to seem a mad world. It is curious how often the past world of our own blood, the scheme of knowledge and scope of meditation and passion, take on this form of apparent madness in the eyes of a modern reader who stops to think. Still more, if one attempts to reconstruct the world of the Arab, the Hindoo, the Chinese, the task grows hopeless; looking into the faces of the orientals, eye to eye, is a blanker thing than gazing at the Sphinx; the mystery of personality seems unfathomable in men by whom fundamental ideas are so differently held and conceived as often to be unintelligible to us and hardly recognizable; and we conclude briefly,—"the oriental is inscrutable." The attempt to fathom a foreign literature is like that of acquiring the language; at first it seems easy, but with progress it becomes hard; and it is the same, but in an infinitely greater degree, with the task of acquiring an Italian or an Arab or a Hindoo soul. The defect of experience in our case allows the imagination

to work only imperfectly in constructing, and the sympathies to flow inadequately in interpreting, the scenes, passions, and moods of other lands and peoples; and literature loses its power in proportion as its necessary appeal to ourselves diminishes. We read Greek books, but not as the Greeks read them; and one of the strange qualities of immortal books is that they permit themselves to be so read and yet to give forth an intelligible and supreme meaning. The reader takes so much of the book as has affinity with him, and it is as if the book were re-written in his mind; indeed, it often happens that the book which was written is not the book which is read, so great is the reader's share in that blending of two souls which is the act of reading; it was certainly thus, for example, that Emerson read Hafiz. The reader's mind enters into every book, but especially into works of imagination; there is something private in his understanding of his author, and this is a greater element in proportion to the vitality and richness of his mind; what he makes of an ancient or a foreign book is often, it must be suspected, something that departs widely from the original author's design. The function of scholarship, in appreciation, is so to inform the reader with respect to the material and environment of the book that he may have the truest possible operation of imagination and the freest

possibly play of sympathy in appropriating the book; but, in comparison with contemporary and native appreciation, it is usually a limited success which is thus gained.

As the study of biography, history, archæology, and other lights on past conditions or alien civilizations are aids to the reader in understanding and appropriating unfamiliar experience, so some study of artistic forms of expression assists him in appreciating literature, particularly in its higher and more refined phases. In poetry, especially, a modest acquaintance with the melodic modes of languages is indispensable; but it need not exceed the limits which would similarly be set for an elementary appreciation of music. It is not a knowledge of prosody, of the different varieties of meter and their combinations, of the technique of verse as taught in books that is necessary; such study is, for the most part, wearisome and fruitless. The essential thing is to be able to read verse, and to read it intelligently so that it declares itself to be verse and not prose by the mere fall of the syllables. It is extraordinary how rare this power has become. It is true that in older modes of education, such as the Greek, the melodic modes of the language were defined and held by the concurrence of the instrument and the dance with the choral movement of the words; but verse, even when not so sustained, has a clear

movement of its own. The ear should be trained by the oral repetition of verse, if it is to be true; but this is seldom done in any effective way. It is not only the keen sense of the melody of verse which has been lost; the significance of the line and the phrase as units of composition is also seldom known. It is not possible to appreciate verse unless it is correctly read, nor to realize its beauty without some sense of its structure, that is, of the unitary value of phrase, line, and stanza, and of the mode of their combination to build up the whole into one poem. To perceive melodic time in verse with its subtle modulation of cadence and rhythm, and to be aware of the interlacing and close junction of phrase and line in which much of the grace and felicity of poetry resides, are labors neither difficult nor long; a little intelligent attention suffices to acquire this power and with it the formal pleasure of literature begins. The way once entered on may lead so far as to the appreciation of a Greek ode or even to pleasure in the intricacies of a Persian song. It is not, however, necessary to go to such lengths. The forms of poetry have their effect, like the forms of other arts, without elaborate study or developed knowledge of technique. Oratory is a mode of address full of artifice, but it is artifice grounded upon nature, so that it sways the "fierce democratic" by itself; and the forms

of poetry are similarly grounded upon nature, and its music plays upon the heart and mind of men by the necessity of their constitution. A scientific and technical knowledge is by no means required of the reader; but an elementary acquaintance with melody and structure, such as to allow correct reading and the perception of the harmonious confinement of thought within the limits of the musical beats of phrase and line, is hardly to be dispensed with. It is questionable, on the other hand, whether much is gained by study of the artistic field in larger matters, such as, for example, dramatic construction. In that direction the reader turns his attention from the work to the workmanship, and may embarrass himself with theory, or preconceptions not universally applicable. But without setting limits to study of whatever sort, for all modes of study have possible uses, it is to be laid down in general that all study of literature in the way of preparation to grasp and understand, whether it be linguistic, historical, or æsthetic, exists to be forgotten and laid off as soon as it is completed; its end is to withdraw one by one the veils, and leave the reader alone with the spirit of the book, which then speaks to him face to face. All the rest was but preliminary; it is only then that he begins to read.

The uses of study in all its kinds being thus subsidiary and a means of remedying defects in

the power of imagination, sympathy, and perception of form, the reader is at last thrown fairly back upon his own experience, or the kind and quality of the life he has lived, for his appreciation of literature; he is left to himself. If the light is not in him, he cannot see; and, in general, large parts of literature remain dark and, even in authors whom he comprehends in the main portions, continue obscure. This is especially true of the greatest works of genius. For the reader the measure of his understanding of the author is the measure of the author; and from this there is no appeal. It results from these conditions that literature is slowly appropriated and is a thing of growth. The reader cannot transcend at the moment his own season; as a child he reads as a child, and as a man, as a man. A boy of ten may read Homer, but he reads him with the power of a boy of ten. It is a child's Homer. The dependence of the book on the reader being so strict, it is always advisable to keep literary study on a near level with life as it is in the individual case. The natural introduction to literature for the very young is by no means of that universal sort which is selected from all ages and requires no study, such as the stories of Scripture, short legendary tales of history, beast and bird fables, fairy tales and the like. They have, besides their intelligibility, the advantage of accustoming the

mind to a make-believe world, natural to childish fancy, and so laying the foundation for that principle of convention which is fundamental in art and indispensable in its practice, and also of making the contemplation of imaginary experience habitual so that there is no shock between it and truth. The transposition by which human experience is placed in the bird and beast world is a literary fiction: as an element in early education it helps to give that plasticity to the world of fact which is essential to the artistic interpretation of life and the imaginary habit of mind. The serious study of one's own literature is most fruitfully begun by acquaintance with those authors who are in vogue and nearly contemporary, the literature of the century preceding, on the well-worn principle of proceeding in knowledge from the better-known to less well-known, and because there is the minimum of necessary study intervening between author and reader. To approach and have practice in the literature that requires study there is nothing better for the beginner than Greek literature, and it has the peculiar advantage for broadening the mind of being a pagan literature and yet closely kindred to our own, presenting human experience under very different conditions from the present, and yet easily realizable in wise and beautiful forms. In Greek literature, too, the universal element is greater

than in any other, and this facilitates its comprehension while the mind becomes accustomed to the mixture with the universal of the past, the temporal, the racial, the obscure, the dead. It is advisable, also, in these early choices and initial steps to consider the season of the reader, to begin with books in which action has a large share and postpone those in which thought is dominant, to favor those of simple rather than of refined emotion, to keep in all things near to the time of life and to that experience especially which is nascent if not already arrived in the reader. And what is true of the beginner is true for every later period. It is best to be honest with oneself, and to respect one's own tastes and predilections; not to read books because they are classics, if they yield no true pleasure, not to force a tame liking, not to feign to oneself, or in other ways to confuse what it is said one ought to like with what one does like sincerely. It is always to be borne in mind that appreciation is a thing of growth. A great book does not give itself all at once, nor perhaps quickly, but the maxim holds good,—slow love is long love. Books naturally fall into three classes: those that are outlived, because the experience they contain and address is shallow or transitory; those that are arrived at late because the experience involved is mature; and those, the greatest, which give something to the youngest

and have something left to give to the oldest, which keep pace with life itself and like life disclose themselves more profoundly, intimately, and in expanding values with familiarity. The secret of appreciation is to share the passion for life that literature itself exemplifies and contains; out of real experience, the best that one can have, to possess oneself of that imaginary experience which is the stuff of larger life and the place of the ideal expansion of the soul, the gateway to which is art in all forms and primarily literature; to avail oneself of that for pleasure and wisdom and fulness of life. It is those minds which are thus experienced that alone come to be on the level of the greatest works and to absorb their life; but the way is by gradual ascent, by natural growth, by maintaining a vital relation with what is read. So long as the bond between author and reader is a living bond, appreciation is secure.

HOW TO READ[1]

FREDERIC HARRISON

It is the fashion for those who have any connection with letters to expatiate on the infinite blessings of literature, and the miraculous achievements of the press: to extol, as a gift above price, the taste for study and the love of reading. Far be it from me to gainsay the inestimable value of good books, or to discourage any man from reading the best; but I often think that we forget that other side to this glorious view of literature—the misuse of books, the debilitating waste of brain in aimless, promiscuous, vapid reading, or even, it may be, in the poisonous inhalation of mere literary garbage and bad men's worst thoughts.

For what can a book be more than the man who wrote it? The brightest genius seldom puts the best of his own soul into his printed page; and some famous men have certainly put the worst of theirs. Yet are all men desirable companions, much less teachers, able to give us advice, even

[1] Reprinted through the generous permission of The Macmillan Company, from *The Choice of Books*, by Frederic Harrison.

of those who get reputation and command a hearing? To put out of the question that writing which is positively bad, are we not, amidst the multiplicity of books and of writers, in continual danger of being drawn off by what is stimulating rather than solid, by curiosity after something accidentally notorious, by what has no intelligible thing to recommend it, except that it is new? Now, to stuff our minds with what is simply trivial, simply curious, or that which at best has but a low nutritive power, this is to close our minds to what is solid and enlarging, and spiritually sustaining. Whether our neglect of the great books comes from our not reading at all, or from an incorrigible habit of reading the little books, it ends in just the same thing. And that thing is ignorance of all the greater literature of the world. To neglect all the abiding parts of knowledge for the sake of the evanescent parts is really to know nothing worth knowing. It is in the end the same, whether we do not use our minds for serious study at all, or whether we exhaust them by an impotent voracity for desultory "information"—a thing as fruitful as whistling. Of the two evils I prefer the former. At least, in that case, the mind is healthy and open. It is not gorged and enfeebled by excess in that which cannot nourish, much less enlarge and beautify our nature.

But there is much more than this. Even to those who resolutely avoid the idleness of reading what is trivial, a difficulty is presented—a difficulty every day increasing by virtue even of our abundance of books. What are the subjects, what are the class of books we are to read, in what order, with what connection, to what ultimate use or object? Even those who are resolved to read the better books are embarrassed by a field of choice practically boundless. The longest life, the greatest industry, joined to the most powerful memory, would not suffice to make us profit from a hundredth part of the world of books before us. If the great Newton said that he seemed to have been all his life gathering a few shells on the shore, whilst a boundless ocean of truth still lay beyond and unknown to him, how much more to each of us must the sea of literature be a pathless immensity beyond our powers of vision or of reach—an immensity in which industry itself is useless without judgment, method, discipline; where it is of infinite importance what we can learn and remember, and of utterly no importance what we may have once looked at or heard of. Alas! the most of our reading leaves as little mark even in our own education as the foam that gathers round the keel of a passing boat! For myself, I am inclined to think the most useful help to reading is to know what we should not read, what we can keep out

from that small cleared spot in the overgrown jungle of "information," the corner which we can call our ordered patch of fruit-bearing knowledge. The incessant accumulation of fresh books must hinder any real knowledge of the old; for the multiplicity of volumes becomes a bar upon our use of any. In literature especially does it hold—that we cannot see the wood for the trees.

How shall we choose our books? Which are the best, the eternal, indispensable books? To all to whom reading is something more than a refined idleness these questions recur, bringing with them the sense of bewilderment; and a still, small voice within us is for ever crying out for some guide across the Slough of Despond of an illimitable and ever-swelling literature. How many a man stands beside it, as uncertain of his pathway as the Pilgrim, when he who dreamed the immortal dream [1] heard him "break out with a lamentable cry; saying, what shall I do?"

And this, which comes home to all of us at times, presses hardest upon those who have lost the opportunity of systematic education, who have to educate themselves, or who seek to guide the education of their young people. Systematic

[1] *Pilgrim's Progress* is an allegory in the form of a dream; "he" refers to the author, John Bunyan, "him" to the chief character, Christian, the Pilgrim. The Slough of Despond is a deep bog into which Christian falls and from which Help rescues him.

reading is but little in favor even amongst studious men; in a true sense it is hardly possible for women. A comprehensive course of home study, and a guide to books, fit for the highest education of women, is yet a blank page remaining to be filled. Generations of men of culture have labored to organize a system of reading and materials appropriate for the methodical education of men in academic lines. Teaching equal in mental calibre to any that is open to men in universities, yet modified for the needs of those who must study at home, remains in the dim pages of that melancholy volume entitled *Libri valde desiderati.*[1]

I do not aspire to fill one of those blank pages; but I long to speak a word or two, as the Pilgrim did to Neighbor Pliable,[2] upon the glories that await those who will pass through the narrow wicket-gate. On this, if one can find anything useful to say, it may be chiefly from the memory of the waste labor and pitiful stumbling in the dark which fill up so much of the travail that one is fain to call one's own education. We who have wandered in the wastes so long, and lost so much of our lives in our wandering, may at least offer warnings to younger wayfarers, as men who in

[1] Books much desired.

[2] The Pilgrim's companion during the first part of the journey to the Heavenly City.

thorny paths have borne the heat and burden of the day might give a clue to their journey to those who have yet a morning and a noon. As I look back and think of those cataracts of printed stuff which honest compositors set up, meaning, let us trust, no harm, and which at least found them in daily bread,—printed stuff which I and the rest of us, to our infinitely small profit, have consumed with our eyes, not even making an honest living of it, but much impairing our substance,—I could almost reckon the printing press as amongst the scourges of mankind. I am grown a wiser and a sadder man, importunate, like that Ancient Mariner, to tell each blithe wedding guest the tale of his shipwreck on the infinite sea of printer's ink, as one escaped by mercy and grace from the region where there is water, water, everywhere, and not a drop to drink.

A man of power, who has got more from books than most of his contemporaries, once said: "Form a habit of reading, do not mind what you read; the reading of better books will come when you have a habit of reading the inferior." We need not accept this *obiter dictum* of Lord Sherbrooke. A habit of reading idly debilitates and corrupts the mind for all wholesome reading; the habit of reading wisely is one of the most difficult habits to acquire, needing strong resolution and infinite pains; and reading for mere reading's sake,

instead of for the sake of the good we gain from reading, is one of the worst and commonest and most unwholesome habits we have. And so our inimitable humorist has made delightful fun of the solid books,—which no gentleman's library should be without,—the Humes, Gibbons, Adam Smiths, which, he says, are not books at all, and prefers some "kind-hearted play-book," or at times the *Town and County Magazine*. Poor Lamb has not a little to answer for, in the revived relish for garbage unearthed from old theatrical dung-heaps. Be it jest or earnest, I have little patience with the Elia-tic philosophy of the frivolous.[1] Why do we still suffer the traditional hypocrisy about the dignity of literature—literature, I mean, in the gross, which includes about equal parts of what is useful and what is useless? Why are books as books, writers as writers, readers as readers, meritorious, apart from any good in them, or anything that we can get from them? Why do we pride ourselves on our powers of absorbing print, as our grandfathers did on their gifts in imbibing port, when we know that there is a mode of absorbing print, which makes it impossible that we can ever learn anything good out of books?

[1] Charles Lamb's delight in reading wellnigh anything ; see "Detached Thoughts on Books and Reading," in *The Essays of Elia*.

Our stately Milton said in a passage which is one of the watchwords of the English race, "as good almost kill a Man as kill a good Book." But has he not also said that he would "have a vigilant eye how Bookes demeane themselves, as well as men; and do sharpest justice on them as malefactors"? . . . Yes! they do kill the good book who deliver up their few and precious hours of reading to the trivial book; they make it dead for them; they do what lies in them to destroy "the precious life-blood of a master-spirit, imbalm'd and treasured up on purpose to a life beyond life;" they "spill that season'd life of man preserv'd and stor'd up in Bookes." For in the wilderness of books most men, certainly all busy men, *must* strictly choose. If they saturate their minds with the idler books, the "good book," which Milton calls "an immortality rather than a life," is dead to them: it is a book sealed up and buried.

It is most right that in the great republic of letters there should be freedom of intercourse and a spirit of equality. Every reader who holds a book in his hand is free of the inmost minds of men past and present; their lives both within and without the pale of their uttered thoughts are unveiled to him; he needs no introduction to the greatest; he stands on no ceremony with them; he may, if he be so minded, scribble "doggrel"

on his Shelley, or he may kick Lord Byron, if he please, into a corner. He hears Burke perorate, and Johnson dogmatize, and Scott tell his border tales, and Wordsworth muse on the hillside, without the leave of any man, or the payment of any toll. In the republic of letters there are no privileged orders or places reserved. Every man who has written a book, even the diligent Mr. Whitaker, is in one sense an author; "a book's a book although there's nothing in 't;" and every man who can decipher a penny journal is in one sense a reader. And your "general reader," like the grave-digger in *Hamlet*, is hail-fellow with all the mighty dead; he pats the skull of the jester; batters the cheek of lord, lady, or courtier; and uses "imperious Cæsar" to teach boys the Latin declensions.

But this noble equality of all writers—of all writers and of all readers—has a perilous side to it. It is apt to make us indiscriminate in the books we read, and somewhat contemptuous of the mighty men of the past. Men who are most observant as to the friends they make, or the conversation they share, are carelessness itself as to the books to whom they intrust themselves, and the printed language with which they saturate their minds. Yet can any friendship or society be more important to us than that of the books which form so large a part of our minds and even

of our characters? Do we in real life take any pleasant fellow to our homes and chat with some agreeable rascal by our firesides, we who will take up any pleasant fellow's printed memoirs, we who delight in the agreeable rascal when he is cut up into pages and bound in calf?

If any person given to reading were honestly to keep a register of all the printed stuff that he or she consumes in a year—all the idle tales of which the very names and the story are forgotten in a week, the bookmaker's prattle about nothing at so much a sheet, the fugitive trifling about silly things and empty people, the memoirs of the unmemorable, and lives of those who never really lived at all—of what a mountain of rubbish would it be the catalogue! Exercises for the eye and the memory, as mechanical as if we set ourselves to learn the names, ages, and family histories of every one who lives in our own street, the flirtations of their maiden aunts, and the circumstances surrounding the birth of their grandmother's first baby.

It is impossible to give any method to our reading till we get nerve enough to reject. The most exclusive and careful amongst us will (in literature) take boon companions out of the street, as easily as an idler in a tavern. "I came across such and such a book that I never heard mentioned," says one, "and found it curious, though

entirely worthless." "I strayed on a volume by I know not whom, on a subject for which I never cared." And so on. There are curious and worthless creatures enough in any pot-house all day long; and there is incessant talk in omnibus, train, or street by we know not whom, about we care not what. Yet if a printer and a book-seller can be induced to make this gabble as immortal as print and publication can make it, then it straightway is literature, and in due time it becomes "curious."

I have no intention to moralize or to indulge in a homily against the reading of what is deliberately evil. There is not so much need for this now, and I am not discoursing on the whole duty of man. I take that part of our reading which by itself is no doubt harmless, entertaining, and even gently instructive. But of this enormous mass of literature how much deserves to be chosen out, to be preferred to all the great books of the world, to be set apart for those precious hours which are all that the most of us can give to solid reading? The vast proportion of books are books that we shall never be able to read. A serious percentage of books are not worth reading at all. The really vital books for us we also know to be a very trifling portion of the whole. And yet we act as if every book were as good as any other, as if it were merely a question of order which

we take up first, as if any book were good enough for us, and as if all were alike honorable, precious, and satisfying. Alas! books cannot be more than the men who write them; and as a fair proportion of the human race now write books, with motives and objects as various as human activity, books, as books, are entitled *à priori*, until their value is proved, to the same attention and respect as houses, steam-engines, pictures, fiddles, bonnets, and other products of human industry. In the shelves of those libraries which are our pride, libraries public or private, circulating or very stationary, are to be found those great books of the world *rari nantes in gurgite vasto*,[1] those books which are truly "the precious life-blood of a master-spirit." But the very familiarity which their mighty fame has bred in us makes us indifferent; we grow weary of what every one is supposed to have read; and we take down something which looks a little eccentric, some worthless book, on the mere ground that we never heard of it before.

Thus the difficulties of literature are in their way as great as those of the world, the obstacles to finding the right friends are as great, the peril is as great of being lost in a Babel of voices and an ever-changing mass of beings. Books are not wiser than men, the true books are not easier to

[1] Floating here and there in the surging sea.

find than the true men, the bad books or the vulgar books are not less obtrusive and not less ubiquitous than the bad or vulgar men are everywhere; the art of right reading is as long and difficult to learn as the art of right living. Those who are on good terms with the first author they meet, run as much risk as men who surrender their time to the first passer in the street; for to be open to every book is for the most part to gain as little as possible from any. A man aimlessly wandering about in a crowded city is of all men the most lonely; so he who takes up only the books that he "comes across" is pretty certain to meet but few that are worth knowing.

Now this danger is one to which we are specially exposed in this age. Our high-pressure life of emergencies, our whirling industrial organization or dis-organization have brought us in this (as in most things) their peculiar difficulties and drawbacks. In almost everything vast opportunities and gigantic means of multiplying our products bring with them new perils and troubles which are often at first neglected. Our huge cities, where wealth is piled up and the requirements and appliances of life extended beyond the dreams of our forefathers, seem to breed in themselves new forms of squalor, disease, blights, or risks to life such as we are yet unable to master. So the enormous multiplicity of modern books is

not altogether favorable to the knowing of the best. I listen with mixed satisfaction to the pæans that they chant over the works which issue from the press each day: how the books poured forth from Paternoster Row might in a few years be built into a pyramid that would fill the dome of St. Paul's. How in this mountain of literature am I to find the really useful book? How, when I have found it, and found its value, am I to get others to read it? How am I to keep my head clear in the torrent and din of works, all of which distract my attention, most of which promise me something, whilst so few fulfil that promise? The Nile is the source of the Egyptian's bread, and without it he perishes of hunger. But the Nile may be rather too liberal in his flood, and then the Egyptian runs imminent risk of drowning.

And thus there never was a time, at least during the last two hundred years, when the difficulties in the way of making an efficient use of books were greater than they are to-day, when the obstacles were more real between readers and the right books to read, when it was practically so troublesome to find out that which it is of vital importance to know; and that not by the dearth, but by the plethora of printed matter. For it comes to nearly the same thing whether we are actually debarred by physical impossibility from getting the right book into our hand, or whether

we are choked off from the right book by the obtrusive crowd of the wrong books; so that it needs a strong character and a resolute system of reading to keep the head cool in the storm of literature around us. We read nowadays in the market-place—I would rather say in some large steam factory of letter-press, where damp sheets of new print whirl round us perpetually—if it be not rather some noisy book-fair where literary showmen tempt us with performing dolls, and the gongs of rival booths are stunning our ears from morn till night. Contrast with this pandemonium of Leipsic and Paternoster Row the sublime picture of our Milton in his early retirement at Horton, when, musing over his coming flight to the epic heaven, practising his pinions, as he tells Diodati, he consumed five years of solitude in reading the ancient writers—

Et totum rapiunt me, mea vita, libri.[1]

Who now reads the ancient writers! Who systematically reads the great writers, be they ancient or modern, whom the consent of ages has marked out as classics; typical, immortal, peculiar teachers of our race? Alas! the *Paradise Lost* is lost again to us beneath an inundation of graceful academic verse, sugary stanzas of lady-

[1] And books, my life, possess me utterly.

like prettiness, and ceaseless explanations in more or less readable prose of what John Milton meant or did not mean, or what he saw or did not see, who married his great-aunt, and why Adam or Satan is like that, or unlike the other. We read a perfect library about the *Paradise Lost*, but the *Paradise Lost* itself we do not read.

I am not presumptuous enough to assert that the larger part of modern literature is not worth reading in itself, that the prose is not readable, entertaining, one may say highly instructive. Nor do I pretend that the verses which we read so zealously in place of Milton's are not good verses. On the contrary, I think them sweetly conceived, as musical and as graceful as the verse of any age in our history. A great deal of our modern literature is such that it is exceedingly difficult to resist it, and it is undeniable that it gives us real information. It seems perhaps unreasonable to many to assert that a decent readable book which gives us actual instruction can be otherwise than a useful companion and a solid gain. Possibly many people are ready to cry out upon me as an obscurantist for venturing to doubt a genial confidence in all literature simply as such. But the question which weighs upon me with such really crushing urgency is this: What are the books that in our little remnant of reading time it is most vital for us to know? For the true

use of books is of such sacred value to us that to be simply entertained is to cease to be taught, elevated, inspired by books; merely to gather information of a chance kind is to close the mind to knowledge of the urgent kind.

Every book that we take up without a purpose is an opportunity lost of taking up a book with a purpose—every bit of stray information which we cram into our heads without any sense of its importance, is for the most part a bit of the most useful information driven out of our heads and choked off from our minds. It is so certain that information, *i.e.* the knowledge, the stored thoughts and observations of mankind, is now grown to proportions so utterly incalculable and prodigious, that even the learned whose lives are given to study can but pick up some crumbs that fall from the table of truth. They delve and tend but a plot in that vast and teeming kingdom, whilst those whom active life leaves with but a few cramped hours of study can hardly come to know the very vastness of the field before them, or how infinitesimally small is the corner they can traverse at the best. We know all is not of equal value. We know that books differ in value as much as diamonds differ from the sand on the seashore, as much as our living friend differs from a dead rat. We know that much in the myriad-peopled world of books—very much in all kinds—

is trivial, enervating, inane, even noxious. And thus, where we have infinite opportunities of wasting our efforts to no end, of fatiguing our minds without enriching them, of clogging the spirit without satisfying it, there, I cannot but think, the very infinity of opportunities is robbing us of the actual power of using them. And thus I come often, in my less hopeful moods, to watch the remorseless cataract of daily literature which thunders over the remnants of the past, as if it were a fresh impediment to the men of our day in the way of systematic knowledge and consistent powers of thought, as if it were destined one day to overwhelm the great inheritance of mankind in prose and verse.

I remember, when I was a very young man at college, that a youth, in no spirit of paradox, but out of plenary conviction, undertook to maintain before a body of serious students, the astounding proposition that the invention of printing had been one of the greatest misfortunes that had ever befallen mankind. He argued that exclusive reliance on printed matter had destroyed the higher method of oral teaching, the dissemination of thought by the spoken word to the attentive ear. He insisted that the formation of a vast literary class looking to the making of books as a means of making money, rather than as a social duty, had multiplied books for the sake of the

writers rather than for the sake of the readers; that the reliance on books as a cheap and common resource had done much to weaken the powers of memory; that it destroyed the craving for a general culture of taste, and the need of artistic expression in all the surroundings of life. And he argued, lastly, that the sudden multiplication of all kinds of printed matter had been fatal to the orderly arrangement of thought, and had hindered a system of knowledge and a scheme of education.

I am far from sharing this immature view. Of course I hold the invention of printing to have been one of the most momentous facts in the whole history of man. Without it universal social progress, true democratic enlightenment, and the education of the people would have been impossible, or very slow, even if the cultured few, as is likely, could have advanced the knowledge of mankind without it. We place Gutemberg amongst the small list of the unique and special benefactors of mankind, in the sacred choir of those whose work transformed the conditions of life, whose work, once done, could never be repeated. And no doubt the things which our ardent friend regarded as so fatal a disturbance of society were all inevitable and necessary, part of the great revolution of mind through which men grew out of the mediæval

incompleteness to a richer conception of life and of the world.

Yet there is a sense in which this boyish anathema against printing may become true to us by our own fault. We may create for ourselves these very evils. For the art of printing has not been a gift wholly unmixed with evils; it must be used wisely if it is to be a boon to man at all; it entails on us heavy responsibilities, resolution to use it with judgment and self-control, and the will to resist its temptations and its perils. Indeed, we may easily so act that we may make it a clog on the progress of the human mind, a real curse and not a boon. The power of flying at will through space would probably extinguish civilization and society, for it would release us from the wholesome bondage of place and rest. The power of hearing every word that had ever been uttered on this planet would annihilate thought, as the power of knowing all recorded facts by the process of turning a handle would annihilate true science. Our human faculties and our mental forces are not enlarged simply by multiplying our materials of knowledge and our facilities for communication. Telephones, microphones, pantoscopes, steam-presses, and ubiquity-engines in general may, after all, leave the poor human brain panting and throbbing under the strain of its appliances, no bigger and no

stronger than the brains of the men who heard Moses speak, and saw Aristotle and Archimedes pondering over a few worn rolls of crabbed manuscript. Until some new Gutemberg or Watt can invent a machine for magnifying the human mind, every fresh apparatus for multiplying its work is a fresh strain on the mind, a new realm for it to order and to rule.

And so, I say it most confidently, the first intellectual task of our age is rightly to order and make serviceable the vast realm of printed material which four centuries have swept across our path. To organize our knowledge, to systematize our reading, to save, out of the relentless cataract of ink, the immortal thoughts of the greatest—this is a necessity, unless the productive ingenuity of man is to lead us at last to a measureless and pathless chaos. To know anything that turns up is, in the infinity of knowledge, to know nothing. To read the first book we come across, in the wilderness of books, is to learn nothing. To turn over the pages of ten thousand volumes is to be practically indifferent to all that is good.

But this warns me that I am entering on a subject which is far too big and solemn. It is plain that to organize our knowledge, even to systematize our reading, to make a working selection of books for general study, really implies a complete scheme of education. A scheme of education

ultimately implies a system of philosophy, a view of man's duty and powers as a moral and social being—a religion. Before a problem so great as this, on which readers have such different ideas and wants, and differ so profoundly on the very premisses from which we start, before such a problem as a general theory of education, I prefer to pause. I will keep silence even from good words. I have chosen my own part, and adopted my own teacher. But to ask men to adopt the education of Auguste Comte, is almost to ask them to adopt Positivism itself.

Nor will I enlarge on the matter for thought, for foreboding, almost for despair, that is presented to us by the fact of our familiar literary ways and our recognized literary profession. That things infinitely trifling in themselves: men, events, societies, phenomena, in no way otherwise more valuable than the myriad other things which flit around us like the sparrows on the house-top, should be glorified, magnified, and perpetuated, set under a literary microscope and focussed in the blaze of a literary magic-lantern—not for what they are in themselves, but solely to amuse and excite the world by showing how it can be done—all this is to me so amazing, so heart-breaking, that I forbear now to treat it, as I cannot say all that I would.

The Choice of Books is really the choice of our

education, of a moral and intellectual ideal, of the whole duty of man. But though I shrink from any so high a theme, a few words are needed to indicate my general point of view in the matter.

In the first place, when we speak about books, let us avoid the extravagance of expecting too much from books, the pedant's habit of extolling books as synonymous with education. Books are no more education than laws are virtue; and just as profligacy is easy within the strict limits of law, a boundless knowledge of books may be found with a narrow education. A man may be, as the poet saith, "deep vers'd in books, and shallow in himself." We need to know in order that we may feel rightly and act wisely. The thirst after truth itself may be pushed to a degree where indulgence enfeebles our sympathies and unnerves us in action. Of all men perhaps the book-lover needs most to be reminded that man's business here is to know for the sake of living, not to live for the sake of knowing.

A healthy mode of reading would follow the lines of a sound education. And the first canon of a sound education is to make it the instrument to perfect the whole nature and character. Its aims are comprehensive, not special; they regard life as a whole, not mental curiosity; they have to give us, not so much materials, as capacities. So that, however moderate and limited the op-

portunity for education, in its way it should be always more or less symmetrical and balanced, appealing equally in turn to the three grand intellectual elements—imagination, memory, reflection: and so having something to give us in poetry, in history, in science, and in philosophy.

And thus our reading will be sadly one-sided, however voluminous it be, if it entirely close to us any of the great types and ideals which the creative instinct of man has produced, if it shut out from us either the ancient world or other European poetry, as important almost as our own. When our reading, however deep, runs wholly into "pockets," and exhausts itself in the literature of one age, one country, one type, then we may be sure that it is tending to narrow or deform our minds. And the more it leads us into curious byways and nurtures us into indifference for the beaten highways of the world, the sooner we shall end, if we be not specialists and students by profession, in ceasing to treat our books as the companions and solace of our lifetime, and in using them as the instruments of a refined sort of self-indulgence.

A wise education, and so judicious reading, should leave no great type of thought, no dominant phase of human nature, wholly a blank. Whether our reading be great or small, so far as it goes, it should be general. If our lives admit

of but a short space for reading, all the more reason that, so far as may be, it should remind us of the vast expanse of human thought, and the wonderful variety of human nature. To read, and yet so to read, that we see nothing but a corner of literature, the loose fringe, or flats and wastes of letters, and by reading only deepen our natural belief that this island is the hub of the universe, and the nineteenth century the only age worth notice, all this is really to call in the aid of books to thicken and harden our untaught prejudices. Be it imagination, memory, or reflection that we address—that is, in poetry, history, science, or philosophy, our first duty is to aim at knowing something at least of the best, at getting some definite idea of the mighty realm whose outer rim we are permitted to approach.

But how are we to know the best; how are we to gain this definite idea of the vast world of letters? There are some who appear to suppose that the "best" are known only to experts in an esoteric way, who may reveal to inquirers what schoolboys and betting-men describe as "tips." There are no "tips" in literature; the "best" authors are never dark horses; we need no "crammers" and "coaches" to thrust us into the presence of the great writers of all time. "Crammers" will only lead us wrong. It is a thing far easier and more common than many imagine, to discover the best.

It needs no research, no learning, and is only misguided by recondite information. The world has long ago closed the great assize of letters, and judged the first places everywhere. In such a matter the judgment of the world, guided and informed by a long succession of accomplished critics, is almost unerring. When some Zoilus [1] finds blemishes in Homer, and prefers, it may be, the work of some Apollonius of his own discovering, we only laugh. There may be doubts about the third and the fourth rank; but the first and the second are hardly open to discussion. The gates which lead to the Elysian fields may slowly wheel back on their adamantine hinges to admit now and then some new and chosen modern. But the company of the masters of those who know, and in especial degree of the great poets, is a roll long closed and complete, and they who are of it hold ever peaceful converse together.

Hence we may find it a useful maxim that, if our reading be utterly closed to the great poems of the world, there is something amiss with our reading. If you find Milton, Dante, Calderon, Goethe, so much "Hebrew-Greek" to you; if your Homer and Virgil, your Molière and Scott, rest year after year undisturbed on their shelves beside your school trigonometry and your old college

[1] Zoilus, fourth century, Greek rhetorician; Apollonius of Rhodes, third century B.C., Greek epic poet.

text-books; if you have never opened the *Cid, the Nibelungen, Crusoe,* and *Don Quixote* since you were a boy, and are wont to leave the Bible and the Imitation [1] for some wet Sunday afternoon—know, friend, that your reading can do you little real good. Your mental digestion is ruined or sadly out of order. No doubt, to thousands of intelligent educated men who call themselves readers, the reading through a Canto of *The Purgatorio,* or a Book of the *Paradise Lost,* is a task as irksome as it would be to decipher an ill-written manuscript in a language that is almost forgotten. But, although we are not to be always reading epics, and are chiefly in the mood for slighter things, to be absolutely unable to read Milton or Dante with enjoyment, is to be in a very bad way. Aristophanes, Theocritus, Boccaccio, Cervantes, Molière are often as light as the driven foam; but they are not light enough for the general reader. Their humor is too bright and lovely for the groundlings. They are, alas! "classics," somewhat apart from our everyday ways; they are not banal enough for us; and so for us they slumber "unknown in a long night," just *because* they are immortal poets, and are not scribblers of to-day.

When will men understand that the reading of great books is a faculty to be acquired, not a

[1] *The Imitation of Christ,* usually attributed to Thomas à Kempis, fifteenth century.

natural gift, at least not to those who are spoiled by our current education and habits of life? *Ceci tuera cela*,[1] the last great poet might have said of the first circulating library. An insatiable appetite for new novels makes it as hard to read a masterpiece as it seems to a Parisian boulevardier to live in a quiet country. Until a man can truly enjoy a draft of clear water bubbling from a mountain side, his taste is in an unwholesome state. And so he who finds the Heliconian spring insipid should look to the state of his nerves. Putting aside the iced air of the difficult mountain tops of epic, tragedy, or psalm, there are some simple pieces which may serve as an unerring test of a healthy or a vicious taste for imaginative work. If the *Cid*, the *Vita Nuova*, the *Canterbury Tales*, Shakespeare's *Sonnets*, and *Lycidas* pall on a man; if he care not for Malory's *Morte d'Arthur* and the *Red Cross Knight;* if he thinks *Crusoe* and the *Vicar* books for the young; if he thrill not with *The Ode to the West Wind*, and *The Ode to a Grecian Urn;* if he have no stomach for *Christabel* or the lines written on *The Wye above Tintern Abbey*, he should fall on his knees and pray for a cleanlier and quieter spirit.

The intellectual system of most of us in these days needs "to purge and to live cleanly." Only by a course of treatment shall we bring our minds

[1] This will kill that.

to feel at peace with the grand pure works of the world. Something we ought all to know of the masterpieces of antiquity, and of the other nations of Europe. To understand a great national poet, such as Dante, Calderon, Corneille, or Goethe, is to know other types of human civilization in ways which a library of histories does not sufficiently teach. The great masterpieces of the world are thus, quite apart from the charm and solace they give us, the master instruments of a solid education.

THE END

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